# THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

*Telegrams*—LANCET, WESTRAND LONDON *Telephones*—GERRARD 4314 & 4315 *Offices*—423, Strand, London, W.C.2

No. XXIII. OF VOL. I., 1922. LONDON, SATURDAY, JUNE 10, 1922. Pp. 112—Price 1s.
No. 5154. Vol. CCII. Founded 1823. Registered as a Newspaper. Published Weekly. Annual Subscription Inland £2 2s. Abroad £2 10s.



THE LATEST VOLUMES IN

## THE STUDENTS' AIDS.

AIDS TO ORGANOTHERAPY.
By IVO GEIKIE COBB, M.D., M.R.C.S. Pp. viii. + 183. Price 5s. net.
AIDS TO BACTERIOLOGY. (4th Edn.)
By W. PARTRIDGE, F.I.C. Pp. vi. + 276. Price 5s. net.
AIDS TO FORENSIC MEDICINE. (9th Edn.)
By W. G. AITCHISON ROBERTSON, M.D. Pp. x. + 140. 3s. 6d. net.
AIDS TO DENTAL ANATOMY. (4th Edn.)
By ARTHUR S. UNDERWOOD, M.R.C.S., L.D.S.
Revised by BAYFORD UNDERWOOD, L.R.C.P., M.R.C.S., L.D.S.
Pp. vi. + 170. Price 3s. 6d. net.
Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, London, W.C.

## J. & A. CHURCHILL'S NEW BOOKS.

PEARCE GOULD'S SURGICAL PATHOLOGY. 6s. net.
MOORE'S MEDICAL OPHTHALMOLOGY. 80 Illus. 15s. net.
ORLA-JENSEN'S DAIRY BACTERIOLOGY. 18s. net.
LEE & GATENBY'S MICROTOMIST'S VADE-MECUM. 28s. net.
BURNS' INTRODUCTION TO BIOPHYSICS. 21s. net.
HEWLETT'S MANUAL OF BACTERIOLOGY. 7th ed. 21s. net.
CRAIG'S NERVE EXHAUSTION. 6s. net.
CROWTHER'S PRINCIPLES OF RADIOGRAPHY. 55 Ills. 7s. 6d. net
PAULI'S COLLOID CHEMISTRY OF PROTEINS. 8s. 6d. net.
London: J. & A. Churchill, 7, Great Marlborough-street, W.1.

By EDWIN L. ASH, M.D.Lond.

## THE PROBLEM OF NERVOUS BREAKDOWN.

Revised Edition Now Ready—10/6 net.
HOW TO TREAT BY SUGGESTION ... ... 2s. net.
Mills and Boon, 49, Rupert Street, London.

## THE HEART AS A POWER-CHAMBER.

A CONTRIBUTION TO CARDIO-DYNAMICS.
By HARRINGTON SAINSBURY, M.D., F.R.C.P.,
Fellow of the Physiological Society, Consulting Physician to the Royal Free Hospital and the City of London Hospital for Diseases of the Chest, Examining Physician to the Royal National Hospital, Ventnor.
Cloth. Demy 8vo. Illustrated. Price 12s. 6d. net.
Oxford Medical Publications,
The *Lancet* Building, 1, Bedford-street, London, W.C.2.

## THE NOSE: PARANASAL SINUSES, NASO-LACRIMAL PASSAGEWAYS, AND OLFACTORY ORGAN IN MAN.

By J. PARSONS SCHAEFFER, M.D., Ph.D.
208 Illustrations, 18 in colours. Cloth, 60s. net.
LANCET.—"A monumental book ..... of great value. ..... A notable contribution to anatomical literature."
BRITISH MEDICAL JOURNAL.—"The book is one which well repays close study. ..... The illustrations are in themselves an education."
*Obtainable on approval by return of post from*
H. R. Ellis, Medical Bookselling Specialist,
9, Lovell's Court, Paternoster-row, London, E.C.4.

## HYPNOTISM AND TREATMENT BY SUGGESTION.

3rd Ed.] [5s. net.
By ALBERT E. DAVIS, F.R.C.S.Ed., L.R.C.P., Hon. Physician to the Liverpool Psycho-Therapeutic Clinic.
"A fascinating book."—THE DAILY NEWS.
Simpkin, Marshall & Co., Ltd., London.

IN THE PRESS. READY IMMEDIATELY. 350 PAGES.
CROWN OCTAVO.
FULLY ILLUSTRATED. Price 12s. 6d. net.

## AURAL SURGERY.

A HANDBOOK FOR THE STUDENT AND PRACTITIONER.
By WILLIAM WILSON, M.D.,
Hon. Surgeon to St. John's Hospital for the Ear; Oto-laryngologist to the Withington and Crumpsall Hospitals and the Booth Hall Infirmary for Children, Manchester.
Messrs. Sherratt and Hughes, Manchester.

PROFESSOR CH. RICHET'S

## ANAPHYLAXIS.

Authorised translation of the original French Edition by J. MURRAY BLIGH, M.D. (Liverp.), M.R.C.P. (Lond.).
Price, post free, 5s. 9d.
Liverpool: University Press, 177, Brownlow Hill, Liverpool.

## DISEASES OF WOMEN.

By T. G. STEVENS, M.D., F.R.C.S., M.R.C.P.,
Obstetric Surgeon, St. Mary's Hospital for Women; Examiner to the Central Midwives Board, &c.
New Edition. Over 200 illustrations. Demy 8vo. Cloth. 20s. net.
University of London Press, Ltd., 17, Warwick-sq., London, E.C.4.

Demy 8vo. Paper covers. 6d. net, post free 7d.

## GONORRHŒA TREATED BY ELECTRO-LYSIS. RESULTS IN 500 CASES.

By CHARLES RUSS, M.B., M.R.C.S., L.R.C.P.
London: John Bale, Sons & Danielsson, Limited, 83-91, Great Titchfield-street, W.1.

Pp. viii. + 262, with 51 Illustrations. Price 8s. 6d. net.

## DISORDERS OF THE HEART.

By ALEXANDER BLACKHALL-MORISON, M.D., F.R.C.P.,
Consulting Physician to the Royal Northern Hospital, &c.
"*The book merits careful perusal and consideration, as it contains many striking criticisms of current theories and a new marshalling of ascertained facts.*"—BRITISH MEDICAL JOURNAL.
Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden, W.C.2.

## A STUDY OF INTESTINAL STASIS.

By J. C. WATT, M.C., M.B., Ch.B., West African Medical Staff.
Demy 8vo, paper covers, with a full page X-ray Plate. 1s. net; postage, inland, 3d.
John Bale, Sons & Danielsson, Ltd., 83-91, Gt. Titchfield St., W.1.

## ESSAYS ON THE SURGERY OF THE TEMPORAL BONE.

By Sir CHARLES A. BALLANCE, K.C.M.G., C.B., M.V.O., M.S., F.R.C.S.,
Consulting Surgeon to St. Thomas's Hospital, &c.
Illustrated by 125 Plates (40 in Colour) and 120 Figures.
In 2 Volumes. Medium 4to. Price 7 guineas.
Macmillan & Co.

FOURTH EDITION. Pp. viii. + 99. With 4 Plates. Price 4s. 6d. net.

## THE INTENSIVE TREATMENT OF SYPHILIS AND LOCOMOTOR ATAXIA BY AACHEN METHODS.

By REGINALD HAYES, M.R.C.S.
THE LANCET says: "No better exposition of the method as practised there can be found than that contained in this little book."
Baillière, Tindall & Cox, 8, Henrietta-street, London, W.C.2.

New (Ninth) Edition. STELWAGON & GASKILL'S Just Issued.

## Diseases of the Skin.

By H. W. STELWAGON, M.D., Ph.D., late Professor of Dermatology in Jefferson Medical College, with the assistance of H. K. GASKILL, M.D., Attending Dermatologist to the Philadelphia General Hospital.

Octavo, 1313 pages. With 401 Text-illustrations, and 29 Coloured and Half-tone Plates. Cloth, 50s. net.

"FULL OF PRACTICAL HINTS."

*"A well-written and scientific manual that has long been valued in this country. It is full of practical hints, well up to date, and admirably illustrated. May be warmly commended to the general practitioner of medicine as well as to the specialist."*—BRITISH MEDICAL JOURNAL.

*W. B. Saunders Company, Ltd., 9, Henrietta Street, London, W.C.2.*

# AIX-LES-BAINS

**SAVOY, FRANCE, 24 hours from LONDON on the direct route from PARIS to ROME. On the border of Lake Bourget.**

**Successful Treatment of**

## RHEUMATISM
## GOUT SCIATICA
## SEQUELÆ OF WAR WOUNDS

**Treatment by**

**Massage while under the Douche.**
**Thermal Sulphurous Radioactive Waters 117° F.**

**OPEN ALL THE YEAR.**

**DIURETIC WATERS** { **Deux-Reines.** **Saint-Simon.** **Massonat.**

**ZANDER INSTITUTE** **Physiotherapy.**

**Springs of MARLIOZ, strong sulphurous waters for throat and bronchial affections.**

AIX-LES-BAINS is the most beautiful and important CENTRE OF TOURIST ACTIVITY in the FRENCH ALPS (64 different Excursions).

Splendid Climate. High level resort: MONT-REVARD, 5250 feet.

*Special Terms at the Hotels from April to June, and in September and October.*

For all further particulars apply to the Comité d'Initiative, Aix-les-Bains; or Office Français du Tourisme, 56, Haymarket, London, S.W. 1.

By Appointment
To H.M. King George V. To H.M. Queen Alexandra.

**Jeyes' Fluid**—Best and Safest Disinfectant.

**Cyllin—Jeyes' Special Fluid.**—The relatively non-poisonous Bactericide.

**Cyllin Medical**—A refined preparation of Cyllin. 22 to 24 times the strength of pure carbolic acid.

**Cyllin Capsules**—Stomachic and Intestinal.

**Jeyes' Lysol (Jeysol)**—Makes a clear solution. 2½ times the strength of pure carbolic acid.

**LANO-Cyllin**—For Burns, Chilblains, Sores, Insect Bites, and Abrasions of the Skin.

**BRANALCANE.** The effective non-poisonous remedy for ULCERATED, RELAXED, and DIPHTHERITIC SORE THROATS, &c. In 2-oz., 6-oz., or 12-oz. bottles.

**Jeyes' Sanitary Compounds Co., Ltd., 64, Cannon Street, London, E.C.4**

# THE LANCET.

No. 5154. LONDON, SATURDAY, JUNE 10, 1922. Vol. CCII.

# CONTENTS.

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

**A LECTURE** on Radiations in the Treatment of Cancer. By ROBERT KNOX, M.D., M.R.C.S. —(*Illustrated*)..... 1131

**AN ADDRESS** on Acute Intestinal Obstruction. By D. P. D. WILKIE, M.Ch., F.R.C.S. ..... 1135

**ORIGINAL ARTICLES.**

On Certain Conditions Associated with Deficient Secretion in the Upper Alimentary Tract. By T. IZOD BENNETT, M.D., M.R.C.P.; and E. C. DODDS, M.R.C.S. —(*Illustrated*)..... 1138

Nitrous Acid Poisoning. BY W. ST. CLAIR MCCLURE, M.R.C.S., L.R.C.P., D.P.H.; and HARRI HEAP, M.Sc., F.I.C. ..... 1142

Complement Fixation in Gonorrhœa: A Series of 1000 Tests. By T. E. OSMOND, M.B. ..... 1143

Basal Fibrosis in Children. By G. T. HEBERT, M.D., M.R.C.P. ..... 1145

The Systematic Use of Poisson's Formula. By G. DE M. RUDOLF, M.R.C.S., D.P.H.—(*Illustrated*)..... 1146

A Case of Infantile Acute Endocarditis. By E. F. SKINNER, M.A., M.B., F.R.C.P. ..... 1147

Maternity Conditions in India. By MARGARET I. BALFOUR, M.B., W.M.S.I. ..... 1161

Medical Services Available for Natives on the Rand Mines. By M. M. PAM, M.B., B.S..... 1174

**MEDICAL SOCIETIES.**

Royal Society of Medicine: Section of Otology: The Resonating System in the Cochlea..... 1148

Tuberculosis Society of Great Britain: Therapeutic Measures for the Relief of Pulmonary Tuberculosis ..... 1149

**REVIEWS AND NOTICES OF BOOKS.**

Epidemiology and Public Health. In three volumes. By Prof. Victor C. Vaughan, M.D., LL.D., and others. Vol. I.: Respiratory Infections..... 1150

Blood Transfusion. By Geoffrey Keynes, M.A., M.D., F.R.C.S..... 1150

Practical Psycho-Analysis. By H. Somerville, B.Sc., F.C.S., L.R.C.P..... 1151

Psychiatrie du Médecin Praticien. Par les Drs. Dide et Guiraud..... 1151

The Microscope. By Conrad Beck ..... 1151

Précis de Microscopie. Third edition. By Dr. M. Langeron ..... 1151

Report of the St. Andrews Institute for Clinical Research, St. Andrews, Fife. Vol. I..... 1152

The Mechanics of the Digestive Tract. By Walter C. Alvarez, M.D. 1152

British Journal of Ophthalmology ..... 1152

Journal of the R.A.M.C. 1152

**LEADING ARTICLES.**

HEALTH AND EFFICIENCY IN THE POTTERY INDUSTRY ..... 1153

RECENT WORK ON YELLOW FEVER ..... 1154

"BRAIN" ..... 1154

**ANNOTATIONS.**

Birthday Honours..... 1155

The Future of Vital Capacity Tests..... 1155

Prevention of Rickets by Light Rays ..... 1156

Mental Hospital Administration..... 1157

Poisson's Formula..... 1157

Cysts of the Labia Minora 1157

Infectious Diseases and Starvation ..... 1158

The Causes of Acute Intestinal Obstruction. 1158

The Manchester Ablution Centres ..... 1158

In Memory of F. C. Donders ..... 1159

**THE GENERAL MEDICAL COUNCIL.**

Dental Business.—Reports by the Examination Committee ..... 1159

**SPECIAL ARTICLES.**

Vienna: International Lecturing.—Marriages, Births, and Deaths in Austria during 1920.. 1160

Royal Institute of Public Health: Congress in Plymouth: Presidential Address.—Delegates Addresses.—Programme of the Congress.—Care of the Expectant Mother ..... 1162

Medicine and the Law: Dying Declarations.... 1163

British Medical Association: Annual Meeting. 1165

**PUBLIC HEALTH SERVICES.**

Municipal Health Department Practice in U.S.A. 1164

**THE SERVICES.**

Royal Army Medical Corps.—Indian Medical Service ..... 1167

**CORRESPONDENCE.**

A Standard Text-book of Surgery for Examination Purposes (Mr. Alexander Miles and Mr. J. Hutchinson).... 1167

First Report of the Miners' Nystagmus Committee (Mr. A. Stanley Percival) 1168

Why is Septic Aural Discharge so Common? (Mr. Macleod Yearsley) 1169

Differential Diagnosis between Cholelithiasis and Ulcus Duodeni (Dr. John Ryle) ..... 1169

The Case of Mr. F. W. Axham (Dr. C. O. Hawthorne) ..... 1170

Scarlet Fever in the Puerperium: An Institutional Outbreak (Dr. Eustace Thorp) ..... 1170

Dangers Arising from the Use of Wrist-Watches (Dr. J. J. Scanlan)..... 1171

The Methods of the Canine Defence League (Mr. A. J. Wilmshurst)..... 1176

**OBITUARY.**

William Halse Rivers Rivers, M.A., M.D., F.R.S. ..... 1171

Dr. C. A. Brodribb..... 1171

**MEDICAL NEWS.**

Fellowship of Medicine and Post-Graduate Medical Association.... 1155

Harveian Society ..... 1162

French League against Infantile Mortality .... 1164

A Central Fund for Hospitals outside London.. 1172

Orthopædic Course at Berck-Plage ..... 1172

Forthcoming Medical Congresses in France..... 1172

Medical Visit to Bath.... 1172

University of Birmingham 1172

Rontgen Society ..... 1172

Infectious Disease in Lancashire ..... 1172

Newcastle-upon-Tyne Post-graduate Course.. 1172

**NOTES, SHORT COMMENTS, &c.**

Centenary of Alexis St. Martin ..... 1175

A Holiday School in Vienna 1176

Golf from Two Sides..... 1176

Cholera in Russia..... 1176

Smokeless Fuel ..... 1176

Alexandra Day ..... 1176

Medical Diary ..... 1173

Appointments—Vacancies 1173

Births, Marriages, Deaths 1174

## Modern Clinic Manuals.

### THE VENEREAL CLINIC.

**The Diagnosis, Treatment, and Prevention of Syphilis and Gonorrhœa. A Handbook of Venereal Disease in relation to the Individual and the Community.** By Several Writers. Edited by **ERNEST R. T. CLARKSON,** M.A. Cantab., M.R.C.S., L.R.C.P. Lond., Chief Clinical Assistant Urogenital Dept. (Males) London Hospital. With an Introduction by Sir SQUIRE SPRIGGE, M.D. Demy 8vo. With 11 Coloured Plates. **25s.** net, postage, inland 1s.

### MANUAL FOR HEALTH VISITORS AND INFANT WELFARE WORKERS.

By Several Writers. Edited by **Mrs. ENID EVE,** late Ministry of Health, and formerly Chief Health Visitor and Sanitary Inspector to the Metropolitan Borough of Holborn.

Demy 8vo. **10s. 6d.** net, postage 9d.

### THE INDUSTRIAL CLINIC.

**A Handbook Dealing with Health in Work.**

Edited by **Prof. EDGAR L. COLLIS,** M.D., M.R.C.P., Talbot Professor of Preventive Medicine in the University of Wales.

With 9 Full-Page Illustrations. Demy 8vo.

**10s. 6d.** net, postage 9d.

### THE TUBERCULOSIS CLINIC.

By Several Writers. Edited by **NOEL D. BARDSWELL,** M.V.O., M.D., F.R.C.P., Medical Officer for Tuberculosis, Public Health Department, L.C.C.; Medical Adviser, London Insurance Committee; Consultant Physician, King Edward VII. Sanatorium, Midhurst.

Demy 8vo. **6s.** net, postage 6d.

**JOHN BALE, SONS & DANIELSSON, LTD., 83-91, Great Titchfield Street, London, W.1.**

# H. K. LEWIS & Co. LTD.

PUBLISHERS AND BOOKSELLERS.

SECOND-HAND DEPARTMENT: 140, Gower Street.

## MEDICAL AND SCIENTIFIC CIRCULATING LIBRARY.

ANNUAL SUBSCRIPTION FROM ONE GUINEA.

LIBRARY READING ROOM (First Floor) open daily to SUBSCRIBERS.

**136, Gower Street, London, W.C.1**

---

NOW READY. FOURTH EDITION

## HYGIENE & PUBLIC HEALTH

WITH SPECIAL REFERENCE TO THE TROPICS.

By B. N. GHOSH, F.R.F.P.S. (Glasg.) and J. L. DAS, D.P.H. (Cal.)

*With an Introduction by*

Col. K. McLEOD, M.D., LL.D., I.M.S. (ret.), Hon. Phys. to H.M. the King

Crown 8vo. Full Cloth. Pp. 507 + xxiv. Price Rs. 6/- or 9s. 6d. net.

EIGHTH EDITION.

## R. GHOSH'S MATERIA MEDICA

By Lt.-Col. B. H. DEARE, I.M.S., and B. N. GHOSH, F.R.F.P.S. (Glasg.).

Crown 8vo. Full Cloth. Pp. xii. + 698. Price Rs. 7/- or 10s. 6d. net.

Publishers: HILTON & CO., P.O. Box 801, Calcutta, India.
London Agents: Simpkin & Marshall, Stationers' Hall, E.C. 4.

---

## STAMMERING. SPEECH DEFECTS. VOICE TRAINING.

BEHNKE METHOD. Est. 1882.

Carried on by Miss BEHNKE, at 39, Earl's Court-square, S.W. 5. Pupils received into residence, summer holidays, at Miss Behnke's house in the country. Early application necessary.

"Pre-eminent success in the education and treatment of stammering and other speech defects."—*The Times.*

Thoroughly physiological principles."—*The Lancet.*

"The method is scientifically correct and perfectly effective."—*Guy's Hospital Gazette.*

*From a Harley Street Specialist.*—"The condition is to a great extent a psychical one, and the admirable results obtained by yourself and your parents have in my opinion been to a great extent due to your personal psychical influence over your subjects. You are at liberty to use this expression of my opinion." (*This letter may be seen.*)

"Stammering: Cleft Palate Speech: Lisping." 2s. 4d. post free.
Of Miss BEHNKE, 39, Earl's Court-square, S.W.

---

## STERILITY IN WOMEN

A BOOK FOR THE WOMAN OF TO-DAY.

A consensus of qualified opinion on a cause of Pelvic Disease.

1/3 POST FREE. H. Holden, South View, Rusthall, Kent.

---

Price 1s. With Illustrations.

## APPLICATION OF TRUSSES

to HERNIÆ. Clinical Lecture delivered at King's College Hospital. By the late JOHN WOOD, F.R.S., Senior Surgeon to King's College Hospital. Reprinted from "Medical Examiner."

London: Matthews Brothers, 10, New Oxford-street, W.C.

---

SECOND EDITION. Cloth. 10/6 net. Postage 6d.

## HYPNOTIC SUGGESTION & PSYCHO-THERAPEUTICS.

By **A. BETTS TAPLIN,** L.R.C.P. & L.M. Edin., Member of Council and late President of the Psycho-Medical Society of Great Britain.

"The book is written with conviction, and with a first-hand knowledge of the subject, wastes no time on speculative matters, and his teaching will be appreciated both by students and practitioners."—*Proceedings of Royal Society of Medicine.*

LITTLEBURY BROS., 3, CROSSHALL STREET, LIVERPOOL.
SIMPKIN MARSHALL & CO. LTD., LONDON.

---

## CLOTH CASES FOR BINDING

THE HALF-YEARLY VOLUMES OF

## "THE LANCET"

Can be obtained through any Bookseller in town or country or from THE LANCET Office.

**Price 3s. 6d. each, by post 3s. 10d.**

Offices: 423 and 424, Strand, London, W.C. 2; and 1, Bedford-street, adjoining.

---

## THE EARLIEST HYGIENIC SHOEMAKERS

[ESTABLISHED SINCE 1824.]

The instructions of the Profession intelligently carried out.

In addition to the Departments for **Ladies and Gentlemen,** special attention is given to provide properly shaped shoes for **Children,** parcels of which can be forwarded on approval to any part of the country. Please send outlines of the feet.

DOWIE & MARSHALL have had great experience in the shoeing treatment of weak ankles and flat feet.

**DOWIE & MARSHALL, Ltd.,** 455, West Strand, Charing Cross, London

G.P.O. Telephone - - No. 9015 Central.

# A Lecture
ON
# RADIATIONS IN THE TREATMENT OF CANCER.

*Given at the Cancer Hospital, London, March 10th, 1922,*

BY ROBERT KNOX, M.D. EDIN., M.R.C.S., M.I.E.E.,

DIRECTOR, RADIOTHERAPEUTIC DEPARTMENT, THE CANCER HOSPITAL; HON. RADIOLOGIST TO KING'S COLLEGE HOSPITAL.

WHEN dealing with cancer the test of value of any method of treatment is severe. Up to the present selection has been easy, the operative method in nearly all cases being the method of choice. Recent publications on the results obtained by X rays in the treatment of cancer would seem to indicate that this first choice demands reconsideration. Operative methods are challenged by those of radiation in the treatment of the disease, and it is insisted on by the advocates of the newer methods that the earlier the case is treated the better is the prospect of cure. At the Cancer Hospital we have so far seen no reason to change our methods. In all operable cases the surgeon is urged to operate, and the patient is treated by radiations subsequent to the operation. There are, however, cases in which the primary growth may be suitable for operation, yet from the presence of other conditions it may not be advisable to operate; in these cases radiations are used.

### BORDER-LINE CASES.

The border-line cases are always the most difficult in which to decide. Rectal carcinoma is unsatisfactory from both points of view, and great judgment is required to decide between the two methods. Failing complete excision of the growth, radiologists prefer to use combined methods—colotomy and subsequent irradiation from several ports of entry, with a maximum dose administered to the growth. The technique has to be very accurately carried out, and demands much skill and patience. Carcinoma of the œsophagus is another condition where judgment must be exercised. It may be necessary to do a gastrostomy for the relief of urgent symptoms, and then to use radium tubes passed into the stricture; very careful technique is required. X rays may be administered in large doses from several ports of entry. Carcinoma of the cervix uteri is also difficult to deal with; we prefer operation whenever it is possible, followed by thorough radiation treatment, in which radium and X rays are combined. In the inoperable case, or one in which it is not considered advisable to operate, the combined treatment is again advocated. We have not so far relied on X rays alone for the treatment of this condition; we intend to test the Erlangen method or a modification of it.

In other cases of deeply seated growth where the operation involves considerable risks the radiation method must receive earnest consideration, and in view of recent developments the claims of radiation are more insistent because it is now possible to apply larger doses at a greater depth then formerly. It is therefore well to consider the radiation method from all points of view and to endeavour to arrive at some conclusion on the matter.

### TECHNIQUE OF RADIATION TREATMENT.

The radiation treatment consists in the use of two agents, radium and X rays, used singly or in combination. Radium rays are preferably employed when dealing with lesions in the interior of the body—e.g., of the œsophagus, uterus, &c. The chief consideration in all cases will be the determination of the technique. The method of attack is similar when either agent is used. The question is how to administer a dose at the seat of the tumour of such an intensity that definite effects will be induced. The technique is devised to attain the particular end, and often great ingenuity must be exercised in the endeavour.

The simplest way to explain the technique of X rays or radium is to take an example of a skin lesion whose extent is limited to the superficial surface—say, a wart, rodent ulcer, or epithelioma, each of which possess a specific response to radiations, and the response may vary greatly. The normal structure also possesses a resistance to the rays beyond which it is not prudent to go. The earlier methods of treatment were evolved from observations on these superficial conditions, and the action upon the skin is still used as the unit of measurement. The period of exposure is modified by the penetration of the ray—i.e., its wave-length, and each value in wave-lengths possesses a specific relationship to the voltage at which it is produced. So it is possible to have a fairly wide range of erythema skin dose, ranging from that produced by the long wave-length of X rays to that resulting from the very short wave-lengths of the hardest gamma ray from radium, and the time taken to produce the erythema may vary from a few minutes to many hours. The time of exposure is also influenced by the quantity of radiation as well as by its quality. A realisation of the multiplicity of the factors in dosage may help to explain failures difficult to understand in the past.

If we take the simple example of a non-malignant superficial skin lesion and subject it to a definite dose certain changes will invariably follow. When the dose given is what is known as an erythema dose, the healthy skin will in the course of a few days (7 to 10) show a definite erythema which lasts for a few days and then slowly subsides, the skin returning to an apparently normal condition. The wart or superficial skin lesion may or may not show changes, according to whether or not it has received its specific quantum of rays. A dose sufficiently powerful to lead to the disappearance of a superficial epithelioma has been estimated as a little more than the erythema dose, about 110 per cent. of the erythema dose. It may be noted that this is by no means invariable. Certain tumours may require several times the erythema dose to produce any change in their structure. Suppose that in estimating the erythema dose for a superficial epithelioma we have used unscreened rays—and it is sometimes an advantage to do so—the time can be determined and fixed, while the particular conditions used for the production of the radiations can also be standardised. But if the voltage of the X ray generator be increased, a harder or more penetrating radiation is now produced. This will give the same effects but in considerably longer time; and the increase in voltage, and consequently in penetration, is accompanied by a proportionate increase in the time taken to produce the erythema dose, until with the penetrating X rays produced at a voltage of 200,000 volts with filtration through zinc and aluminium it may be possible to administer a dose extending into an hour or more to each skin area.

When a full erythema dose of such a penetrating radiation is used for a superficial skin condition the tumour should, after a time, show definite changes, and may in the end altogether disappear. When the skin dose for a particular type of tumour is ascertained, theoretically it should be possible to produce similar changes in a deep-seated lesion if the same percentage of the radiation can be conveyed to it. That is the great question that has been answered by the introduction of more precise methods of deep therapy, and it should be clearly stated that if the correct dose of the correct wave-length can be delivered at the seat of a lesion it matters very little whether the source of radiation is an X ray tube or a quantity of radium.

When using a quantity of radium for the same purpose the hard gamma rays may be utilised if 2 or 3 mm. of lead are used as a filter. The time factor is then enormously prolonged; as many as 12 hours may be required to get an erythema dose. The carcinoma dose has been worked out on these

lines, and the susceptibility of tumours of varying malignancy has been provisionally ascertained. It must be insisted upon, however, that the problem is not nearly so simple as the above statement makes it appear to be; there are many factors which modify or negative these broad generalisations, and to my mind the time has not yet come when we can accept as proven the "lethal cancer dose" so confidently described by some writers. We may find that the "lethal" dose requires to be determined in each individual case.

*Action of Radiations on the Tissues.*

The blood offers an excellent field for the investigation of the action of radiations. It is the tissue of the body most amenable to observation, and it can be used as a guide to the effect of the treatment. All cases should be examined at the commencement of treatment and at regular intervals during the course. Important information for the guidance of the radiologist is often obtained in this way. It is also very useful as a method of study of the effect of radiation upon the cells. The blood examination is most likely to give us first-hand information regarding the action upon tissues in general. Space will only allow of one example of the usefulness of blood examination in treatment. A case of spleno-medullary leukæmia is taken; this disease may be regarded as a malignant one akin to sarcoma in other tissues.

S. C., 44, single. Family history very good; no case of leukæmia in family. Preceding illnesses: Malaria two days in 1911, one day 1920. Tonsillitis; chronic tooth sinus; diphtheria; catarrh of lungs; small hæmorrhages and pain in right kidney, 1915; hæmorrhages on coughing; defæcation; blowing nose; unaccountable bruising. In 1918 continuous fever, 102°–103° for 17 days; spleen slightly enlarged; lost 2 st. In December of that year three weeks' morning diarrhœa during voyage home. In April, 1919, large spleen discovered reaching down into false pelvis 1½ in. across middle line; liver and heart enlarged; myeloid leukæmia diagnosed. On May 7th leucocytes, 600,000; reds, 4,000,000. On the 13th X rays begun. Leucocytes, 200,000; reds, 3,200,000; Hb, 60 per cent. On the 30th leucocytes, 100,000; reds, 3,730,000; Hb, 76 per cent. Splenectomy here advised. Patient consulted the late Sir William Osler, who recommended continuing with X ray treatment.

On June 20th last dose first series X rays. On July 3rd, whites 5000. On the 29th, whites 3200. Blood counts were as follows:—

| | Whites. | Reds. | Hb. |
|---|---|---|---|
| Aug. 18th .. .. .. .. | 4,800 | 6,500,000 | 95* |
| Sept. 15th .. .. .. .. | 5,200 | 5,700,000 | 95 |
| ,, 23rd .. .. .. .. | 6,400 | 4,900,000 | 95† |
| Nov. 13th .. .. .. .. | 7,000 | — | 100 |
| Dec. 11th .. .. .. .. | 14,000 | 5,300,000 | — |

* One megaloblast seen. † No megaloblast seen.

On Jan. 1st, 1920, Osler and former teacher advised patient to continue X rays. Bones as well as spleen to be irradiated. Osler pleased with progress and with smallness of spleen.

Present symptoms: (1) Slight diarrhœa from intestinal fermentation; (2) slight cough; (3) change of temperament from sanguine to placid; (4) slight clonic contraction of muscles when exhausted. Capacity for work: Can do half-day's work in epileptic colony, 330 patients, and take charge when superintendent is away. In 1920 only lost one day's work.

From January, 1920, to within a few months ago, the patient continued to attend for treatment, keeping on the whole fairly well with fluctuations in the white blood count. In February, 1922, the white blood count was 168,000. A large dose of radium from 200 mg. of radium bromide was given—about 20 hours in all. The white count fell to 47,000 within a day of the treatment; a fortnight later it was 17,000. On March 7th, 41,000. Very marked changes in the blood cells were noted.

Superficial lesions are the most favourable for treatment, in so far as they can be kept under continual observation; occasionally it is possible to remove a piece of tissue for examination, when changes in tissue due to the treatment may be noted and the exact character of the condition ascertained. The study of the changes induced in superficial structures gives an accurate indication of the type of case likely to respond to treatment, and also illustrates clearly the probability of influencing deeper morbid conditions; for it will be seen that the simple conditions, such as chronic inflammatory lesions, simple ulcers, nævus, &c., can be beneficially treated with a remarkable accuracy, while those conditions which verge on the malignant—i.e., rodent ulcer and epithelioma—are more intractable, the very malignant forms of carcinoma frequently resisting treatment altogether.

Exactly the same sequence is noted in the so-called deep therapy. The effects are, however, much more difficult to obtain on account of the greater difficulty in administering the correct dosage; more penetrating radiations are required in order to reach the depth of the lesion, while the intervening tissues absorb in a diminishing ratio, according to their depth from the surface, the radiations which have to pass through them to reach the tumour. When these difficulties are allowed for, it will be seen that the order of response is almost identical with that of the more superficial lesions.

*Response of Accessible Enlarged Glands.*

The next step in our survey deals with the response of enlarged glands when situated in an accessible position, such as the cervical region, the axilla, or the groin. It will be found that these glands respond to a definite dose of radiation in a fairly constant manner. In a paper published in the *Archives of Radiology and Electrotherapy* (June, 1916) the following response to radiations was recorded:—

1. *Simple Inflammatory Glands.*—Quickly influenced by a few exposures. This is not applicable to enlarged glands in which the inflammatory process has passed on to the formation of pus.

2. *Lymphadenomatous Glands.*—Less quickly acted upon but almost invariably diminished in size, quickly after a number of exposures to hard radiations.

3. *Tuberculous Glands.*—Not readily affected. It requires a large number of exposures at short intervals to induce retrogressive changes, but ultimately these also slowly respond to radiation treatment.

4. *Malignant Glands.*—Also influenced. Sarcomata give a quicker response than carcinomata; they may disappear, but are apt to reappear. Carcinomatous glands are the slowest of all to be influenced and rarely disappear under treatment, but may diminish considerably in size.

5. *Enlarged Glands due to a Mixed Infection.*—Enlarged lymphatic glands are met with in various parts of the body, and are usually due to one of the foregoing causes; but it must be clearly realised that the predominant cause need not necessarily be the only one. Cases of mixed infection occur, and at times behave in a disconcerting manner when an attempt is made to classify the type of gland according to the response to treatment, either by drugs or radiation.

CONSIDERATION OF POINTS IN THE TECHNIQUE OF X RAY THERAPY.

It will be profitable to consider very briefly the technique of the application of the rays. It might be assumed that in order to avail ourselves of the radiations of all wave-lengths complicated apparatus will be required. In the case of X rays this means very powerful electrical machinery and most modern tubes. The employment of very high voltages, 200,000 and upwards, necessitates the provision of adequate protective devices, and these must safeguard the operator and the patient from the real dangers, (*a*) risk of death or severe injury from electrical shock, (*b*) direct effect of over-exposure to the radiations, and (*c*) injurious effects from the inhalation of deleterious gases, &c., generated in the vicinity of active X ray tubes and high-tension gear.

Continental workers in the past have given us valuable help in this most important subject, and recently a great deal has again been heard of the newer method for the application of X rays in malignant disease. Whilst full credit must be given to the investigators at Erlangen and elsewhere in Germany, sound work has also been done in other countries. In French centres excellent work is going on with apparatus as good as any manufactured in Germany. In America the standard of manufacture is very high, and both in the tube production and the X ray apparatus our colleagues are fortunate in the possession of all the requirements for deep therapy. Yet we are now told that to get the results in the

treatment of cancer we must use Erlangen apparatus and particular tubes, and some of our professional colleagues even support these views by using the Erlangen apparatus themselves. No one, up to the present, has taken the trouble to inquire what has been done in this country in the treatment of malignant disease. Yet during recent years results have been obtained in England which compare favourably with those in other countries. In this hospital a technique has been evolved which in a number of cases has given satisfactory results, and this technique is constantly being developed and improved; indeed, we hope that before long our arrangements for deep therapy will place the technique and treatment at the Cancer Hospital in the very first rank.

The chief points in the technique of the treatment of deep-seated lesions are: (1) The employment of a radiation of sufficient penetrative power to reach the lesion and to ensure the absorption of a proportion of the rays in the tumour; (2) the use of the radiation for a time sufficiently long to ensure the administration of the dose, which may occupy as long as from 7 to 12 hours with the present apparatus; (3) employment of several ports of entry in the majority of cases, because of the risk of over-exposure to the skin and superficial structures.

In Germany the method followed is a modification of the many ports of entry, three or four areas in front and as many from the posterior aspect being employed, each being directed towards the area of disease. The advances made are: (1) The employment of a more penetrating radiation. (2) The administration of a long dose. (3) The introduction of a comparatively accurate method for measuring the dose administered.

It has been our practice to employ a technique similar in most respects, except that on account of the limitation of current the shorter wave-lengths could not be employed. The aim in each administration has been to obtain at the seat of the lesion a dose of the value of a full pastille dose, measured on the distal side of the filter. As many as 12 to 20 areas have been used to get the dose; for deep-seated mediastinal lesions as many as 40 areas on the chest walls have been employed. Good results have been obtained in such cases. Whenever possible the action of X rays has been supplemented by the insertion of radium tubes into or in the vicinity of the growth. From this combination a most useful technique has been evolved, which in a number of cases has given as satisfactory results as those claimed for the Erlangen technique, in which the X rays have been employed in conjunction with ionisation, a colloidal salt of copper being used.

Another important improvement introduced in Germany has been the utilisation of the ionisation method of measuring the radiations. It is definitely stated by the advocates of the Erlangen technique that the cancer dose is equivalent to from 90 to 110 per cent. of the erythema dose. I assume that those who make this statement are referring to a quality of radiation attained under specific conditions in regard to voltage, primary and secondary current, and penetration. The erythema on the skin is taken as an indication that the full dose consistent with safety to that structure has been given, and that of the beam of rays projected into the tissues a definite percentage reaches a spot at which a tumour exists; this percentage, of course, varies in different cases, so it is necessary in each case to calculate the number of areas of skin which must receive a full dose if the 100 or 110 per cent. dose is to be given at the depth. This is a matter of calculation and the accuracy of the administration will depend upon the thoroughness of the technique. The consideration of the dosage required to destroy particular types of new growths must be left for further discussion, but it must be pointed out that nothing like absolute accuracy has yet been attained, though claims are made that the cancer cure dose has been decided.

The statement is made that 40 per cent. of the erythema dose will be a stimulating one, and that if any portion of a tumour receives 40 per cent. of such a dose it will be stimulated, and increase in size. A pronouncement of such weighty nature has given rise to grave doubts regarding the use of any radiation other than that possessing the properties lethal to cancer cells; so serious is the situation that a well-known authority has ventured, in a recent publication, to suggest that all treatment on the old lines should at once be stopped because of the danger of stimulation of the cancer cells.

It may be safely said at once that there is no need for such an alarmist view of the matter. To begin with, it is the experience of all radiologists that superficial recurrences have been checked and cleared up by what, under the new estimate, would be regarded as a stimulating dose. In regard to tumours situated deeply in the body, the dose after repeated administrations rarely approximates to 40 per cent. of the total radiation, measured on the skin, unless some method of centring the rays is employed. Then, again, it must be remembered that what may be a stimulating dose for the cancer cells is also likely to be a stimulating dose for the normal tissues, which, being more vigorous, may by such a stimulation be induced to overcome the cancer cells and cause their disappearance. It might be argued on fairly safe lines that such a line of treatment is correct, and that all our efforts should be directed towards the strengthening of the natural power of the tissues in their fight against the invading cells. In a large number of cases which have responded favourably to the older methods the dosage administered has certainly been stimulating rather than depressing. Dosage which so seriously devitalises the normal tissues as does, apparently, full treatment by the Erlangen method, certainly lays itself open to this objection. After a full treatment the condition of the blood is so greatly and prejudicially altered that no further treatment is recommended until it has recovered; six weeks or more may elapse before the blood approaches to the normal again. Does not such a treatment raise doubts regarding the future of tissues other than the blood, and is it not possible that during the period of depression very serious deleterious effects may be produced? Contrasted with the shock of a very thorough surgical operation, the condition of the patient after thorough deep therapeutic measures may be much more serious. In operative measures the tissues quickly recover, and beyond a temporary anæmia very little change takes place in the blood.

*Improvement in the Method of Applying the Rays.*

The point I wish particularly to deal with is the accurate administration of the predetermined dose. In 1915 a paper was published in the *Archives of Radiology* setting forth the experimental work which had resulted in the elaboration of a new type of tube stand, in which the principle of rotating the tube had been incorporated. The apparatus is the outcome of the work of the staff of he electrical and radiotherapeutic department. Owing to the pressure of war work the experimental work had to be postponed until quite recently, when it was taken up again and a newer model constructed.

In the first experiment the tube was set at an angle of 32½°, the skin surface was 14½ inches from the anticathode, the focus-point at 26½ inches from the anticathode. Fig. 3 represents photographic records taken with this setting, and shows three surface circles, with the rays converging to the same focus on a plate underneath and at right angles to the surface plate. The plates remained in the same position during the three exposures.

In another experiment the anticathode was set at 13½ inches from the skin—the plate representing the tumour to be treated was 19 inches from the anticathode, this being the area of maximum irradiation, the size of the circle being 5½ inches mean diameter. It was found that the tumour plate received a dose of 151 X, while any measured portion of the

FIG. 1.

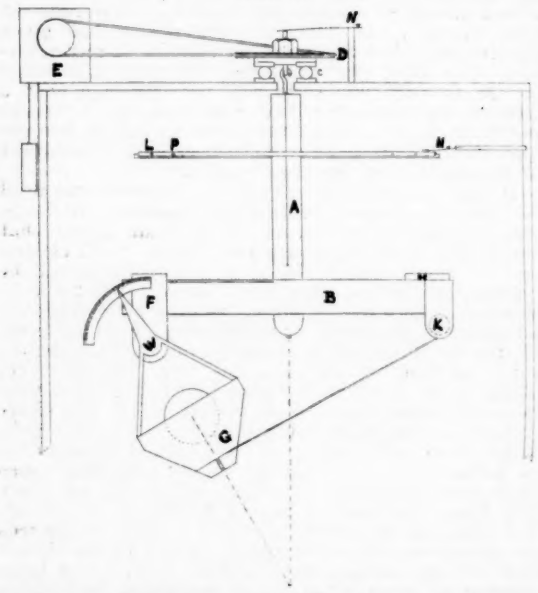



Diagram to explain the mechanical details of rotating tube mechanism. A, Main support of rotating tube holder. B, Horizontal arm to carry the tube box—note in this model a counterweight is placed at the end opposite to the tube box. C, Ball-bearing mechanism. D, Driving wheel for rotating the structure. E, Clockwork apparatus (a small motor has been substituted for this in a later model). F, Support for the tube box. G, Lead-lined tube box with tube in position. N, High-tension lead (+ pole). M, High-tension lead (− pole). P, Rotating metal circle for the negative lead. The dotted lines projected from the bottom of the tube box indicate the projection of the beam of rays. This meets a line dropped vertically down from the centre of the vertical upright. The point of intersection of the two lines indicates the focus spot.

skin plate received 12 X. The total time taken to procure the 151 X was 192 minutes. The relative proportion of tumour dose to skin dose was 12·5 to one. The dose was given from a moderately soft tube and no filters were used. The actual time taken to produce these results will be greatly shortened when harder tubes are used and larger outputs from the transformer utilised, but it is reasonable to expect that the relative proportions of dosage indicated will be maintained.

The description given under Fig. 1 fully explains the mechanical features of the apparatus. These are capable of several improvements which will be added as experience in its use teaches their necessity (Fig. 2). The advantages claimed for this therapeutic localiser are: (1) Accuracy of application. (2) The possibility of repeating at subsequent exposures the dose primarily given. (3) The radiations can be varied in depth and latitude in order to influence all portions of a growth. If desired, the focus-point can be fixed in front of, or behind, or at the centre of the growth. (4) By changing the size of the circle two or more doses can be directed to the centre of the growth (see Fig. 3). A centrally situated growth can be approached from all aspects of the body and the maximum dose given to an area in which a tumour is situated. These experiments are being repeated under more recent conditions.

The interest taken by the public in the treatment of cancer by X rays was increased by newspaper propaganda in favour of the new methods of treatment introduced at Erlangen. In view of the extravagant claims of a high percentage of cures there obtained, it is interesting to note the following quotation from a paper by Dr. Reginald Morton published in THE LANCET,[1] who makes the following very important statements regarding the conditions favourable for success:—

"First, there is the general health of the patient; secondly, the lesion must be localised to a reasonably small area and treated before it has begun widely to invade the adjacent tissues and before there is any distant dissemination; thirdly, the technique must be carried out *accurately* and *completely* at one sitting, so that every part of the lesion receives the requisite dose; and lastly, the health and well-being of the patient must be carefully controlled subsequent to irradiation."

These statements admirably outline the desiderata for successful treatment by X rays; but surely these are also the most favourable conditions for complete surgical removal in the majority of cases. It should be realised that radiations can be used soon after operation, even at the time of operation, and—in cases where time allows—before operation. The pre-operative treatment should be aimed at the outlying districts of the region to include the whole field of lymphatic spread. If the tumour is a large one no attempt should be made to act directly upon it, save in so far as it gets a percentage of the dosage given to the surrounding areas. When an operation is arranged for as soon as a diagnosis is made pre-operative treatment is not recommended, because if it is to be useful it must be of the intensive type, and this would reduce the patient's powers of resistance too seriously and might prejudice the chances of complete recovery. As soon as possible after operation the treatment may be arranged for and given on the lines of a definite technique. In view of recent developments in output of rays a revision of technique must obviously be made; the treatment may have to be much more intensive than the old method allowed for.

*The Erlangen Technique.*

The Erlangen technique must now be briefly referred to.[2] It consists of a somewhat intensive form of X ray treatment, with which is combined in a number of cases a prolonged exposure to ionisa-

FIG. 2.

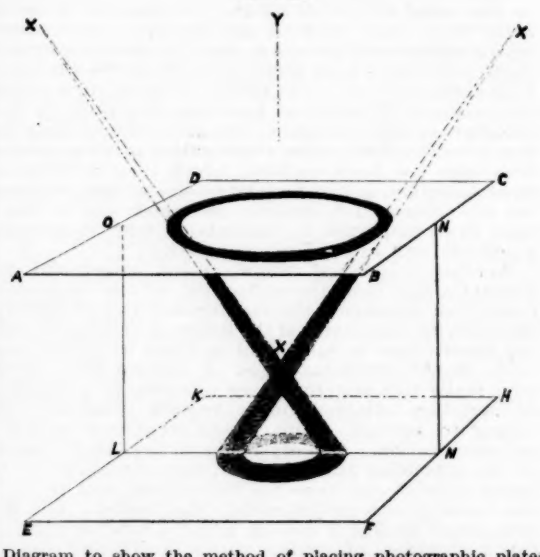



Diagram to show the method of placing photographic plates to obtain information regarding the path of the beam of X rays. Let A B C D, E F H K be two parallel planes and L M N O a plane vertical to them. Let the centre of rotation Y pass through the plane L M N O. Let X be any pencil of rays proceeding from an anticathode X. The tube being fixed at a constant angle to, and rotating round the centre of rotation Y. Then the rotating ray X will describe the circle shown on the plane A B C D. The rays from opposite points in the circle of rotation will converge at X and diverge beyond it to describe the circle drawn on the plane E F H K.

[1] THE LANCET, Feb. 25th, 1922, p. 364.

[2] For further information on the principles underlying the carrying out of the Erlangen technique, the admirable summary given by Dr. H. Kingsley Ward in THE LANCET, Feb. 25th, 1922, p. 366, should be read.

tion, a copper salt in a weak solution being used. The solution is applied to the growth as directly as possible. This portion of the technique necessitates a long exposure. extending from six to eight hours or more. On the day following the ionisation the X rays are given several hours at one sitting, five to eight or nine, according to the case. The patient requires in the majority of cases an opiate for this exposure. It is thus clear that the thorough application of the Erlangen technique is a most elaborate and intricate procedure, and one which demands the utmost skill and care on the part of an expert radiologist. A word of warning will not be out of place to a body of men who will

FIG. 3.

Photographic records taken with tube set at an angle of 32½°, skin surface 14½ in. from anticathode, focus-point 26½ in. from an anticathode. Three surface circles (A, B, C) are shown with the rays converging to the same focus (X) on a plate underneath and at right angles to the surface plate. The plates remained in the same position during the three exposures.

in the end have the charge of patients who have undergone this treatment. The treatment is likely to be useful only in specially selected cases, in which the condition is not advanced.

It is by no means a treatment to recommend until one is satisfied that the technique can be carried out, and in every case recommended the surgical method should first receive earnest consideration. Many sets of Erlangen apparatus have been imported into this country, and will be used for the treatment of patients suffering from cancer. It is our duty to safeguard the public in this matter, and to explain to patients the advantages and the disadvantages; above all, we must assure ourselves that the technique is in the hands of competent radiologists, who have had experience of it. The mere purchase of an Erlangen apparatus is not enough to ensure the proper application of the dose. Our experience of the results of the treatment is at present limited, but one can have no hesitation in contradicting the somewhat sensational announcements in the press some time ago of a high percentage of cures by X rays in malignant disease.

The following letter from Sir Charles Ryall on the subject is interesting, in so far as he gives the condition of a patient before the treatment and at the present date, four and a half months after the treatment. I examined the patient recently and can corroborate what Sir Charles Ryall says about the condition. The patient is cachectic, complains of severe pains in the pelvis, is sleepless, and obviously losing weight. The local condition is that described.

"I am sure you must be interested in the case I sent round to you. The patient came to me first on Sept. 26th, 1921, when she was 35 years of age, to arrange for a hysterectomy. I found that she had carcinoma of the cervix which was tending to extend into the left fornix, and I did not consider it a suitable case for operative treatment. The disease was not greatly advanced, and in fact a fortnight previously a well-known gynæcologist had advised hysterectomy. As the husband is a German I advised the patient to go to Erlangen for treatment. This she did, and commenced the treatment on Oct. 15th, 1921. It lasted two days, then there was an interval of eight weeks, followed by another two days' treatment. She tells me that two days later, and this would be about the second week in January, the cure was complete. There is, of course, a difference between the English and German word 'cure,' and this must not be overlooked, but she used the word 'cured.' When I recently examined her per vaginam and per rectum, I found that the soft friable growth which she originally had is now converted into a hard, nodular mass, which bleeds on examination, and this mass is fixed in the pelvis where it was previously movable. In spite of treatment the disease has developed, and developed rapidly, but we must remember that in people of her years the rate of growth is more rapid than in those of more advanced years. This is the only case which I have seen both before and after the Erlangen treatment, and I fail to see that she has derived any benefit from it."

I fear we are likely to have many cases showing a like result, and if we are to avoid bringing discredit upon X ray therapy we should be careful to select only cases which give promise of a satisfactory result, or at least a chance of improvement.

# An Address
ON
# ACUTE INTESTINAL OBSTRUCTION.

*Delivered before the Pathological Society of Manchester*

BY D. P. D. WILKIE, M.CH. EDIN., F.R.C.S. ENG.,
ASSISTANT SURGEON, ROYAL INFIRMARY, EDINBURGH.

No better example than the subject of acute intestinal obstruction could be found to illustrate the value of a training in pathology for the successful practice of surgery. The diversity of lesion which may give rise to obstruction of the bowel, and the numerous factors which unite to endanger the patient's life in such cases, combine to make the sure and intelligent handling of them a special field for the surgeon pathologist. The subject can be approached from various standpoints; I choose the one which offers greatest difficulty, not because I have fresh light to bring to bear on it, but because it commands the widest interest for a pathological society. The study of the cause of death in acute intestinal obstruction has occupied the attention of workers in experimental laboratories for many years, particularly in the last decade. During the past 15 years the death-rate in many acute abdominal maladies surgically treated has fallen by over 50 per cent., notably in perforations of the stomach and duodenum and acute appendicular disease. It is otherwise with acute intestinal obstruction, in which the death-rate, in spite of surgical treatment, is still little short of 50 per cent.

The first lesson to be drawn from such a statistical study is that earlier diagnosis and more prompt treatment must be aimed at, and that there is nothing to gain by temporising with measures short of surgical operation. In all cases where doubt exists as to the exact diagnosis, abdominal exploration is much less risky than delay. The second lesson is to ask ourselves if the generally adopted methods of treatment are best fitted to save the maximum number of cases, and what are the causes from which patients suffering from intestinal obstruction die.

Before attempting to answer such a question it is essential to distinguish the main fundamental types of obstruction—viz.: (1) Simple obstruction of the intestinal lumen in its continuity—e.g., from a gallstone, from pressure by a band, or from a stenosis of the lumen; (2) isolated closed obstruction of a segment of the gut without interference with its blood-supply—e.g., acute obstruction of the appendix; and (3) obstruction of the lumen plus interference with the blood-supply of a segment of gut as in the various forms of strangulation. Much confusion has arisen from a failure to distinguish between those types, and the classical work of Kader has often been overlooked. The obstruction to the continuity of the lumen of the bowel—present in all except appendicular obstructions—does not affect the fact that in some it is the vital factor, in others only a secondary consideration.

I propose to consider these types separately commencing with type (3).

### OBSTRUCTION OF LUMEN WITH INTERFERENCE WITH VASCULAR SUPPLY.

The large group of cases which fall under this heading, including as it does internal strangulations, volvulus, intussusceptions, and the various forms of strangulated hernia, provides a very substantial proportion of the fatalities. Following up the work of Albeck[1] and of Murphy and Vincent,[2] I carried out some years ago a long series of experiments on this type of obstruction. I found, as others had found, that the most rapidly fatal form of strangulation was that where the venous return from the strangulated loop was interfered with, whilst the arterial supply was not completely obstructed. Such animals would die sometimes within a few hours of the strangulation and before any recognisable peritoneal infection had occurred.

Several series of experiments were performed to test the toxicity of (*a*) the content of the strangulated loop after filtering off the bacteria, (*b*) extracts of the partially necrotic intestinal wall, and (*c*) the blood-stained peritoneal exudate. I found that none of these products when injected intraperitoneally into animals produced any profound toxic symptoms and whilst toxic absorption could by no means be excluded it did not appear to be the chief cause of the rapidly fatal course of the condition. Shock seemed to be the predominant element in the picture, the early signs of collapse with subnormal temperature and low blood pressure being very striking. In some animals death would occur within as short a space as five hours apparently from shock. In others which survived for longer periods toxic absorption and even peritoneal infection undoubtedly played a considerable part.

The practical lesson drawn from this experimental work was the paramount importance of prompt surgical intervention in such conditions which are by far the most urgent of all acute abdominal maladies. Before, during, and after operation all efforts must be made to minimise and combat shock and the toxæmia from which such patients may suffer. Thus morphia freely given, subcutaneous saline, and gas-oxygen anæsthesia are all indicated. In spite of all these measures, however, this group of cases will continue to contribute a considerable percentage to the mortality tables.

### ISOLATED CLOSED OBSTRUCTION OF A SEGMENT OF THE GUT.

Much experimental study of the cause of death in intestinal obstruction has been carried out by observations on the closed intestinal loop. Before proceeding to analyse the results of this work, it will be well for us to consider what the conditions in the human subject are in which this variety of obstruction occurs. We find it in obstructed hernia, where a loop of intestine is occluded at both ends by pressure from without, whilst its blood-supply is interfered with hardly at all. We find it a potent factor in strangulated hernia, although obscured to some extent by superadded vascular changes. In some cases of constriction of a loop of intestine by a band within the abdomen it is an important although not the only factor operative. Most typically and in its purest form is it seen, however, in the acute obstruction of the vermiform appendix where a concretion suddenly plugs a stenosis of the lumen of that organ.

The experiments of Stone, Bernheim, and Whipple[3] showed that when a closed loop of duodenum is isolated the intestinal tract being preserved by a gastro-enterostomy, severe symptoms of toxæmia supervene. They found that the content of the loop and also extracts of the wall of the loop, if filtered and injected into another animal, produced symptoms of collapse, vomiting, diarrhœa, and great splanchnic congestion. Dragstedt[4] showed, however, that if the ends of the duodenal loop in the dog were left open the animal did not show toxic symptoms, and when killed some weeks later the ends of the loop were found to be sealed and the loop contained mucoid fluid under low tension. Whilst Whipple has maintained that the toxæmia in such obstruction is essentially a proteose intoxication arising from a perverted action of the intestinal mucosa of the obstructed loop, most other observers, including Murphy, Brooks,[5] the Dragstedts, and Davis and Stone,[6] emphasise the essential part played by bacteria in the splitting up of the protein molecule, and the evil effects of the absorption of products of the toxic proteose group. Moreover, Sweet, Peet and Hendrix[7] have shown that the oft-quoted experiments of Stone, Bernheim, and Whipple were not so convincing of the elaboration of a lethal poison in a closed duodenal loop as at first sight they appeared. They showed that in all probability the greater part of the toxæmia was from the undrained segment of duodenum above the closed loop. By joining up the cut end of the duodenum to the jejunum instead of doing a gastro-enterostomy they found that animals would survive for ten days or even much longer and would in some cases only die when, from excessive distension, the loop gave way and perforated.

#### *Personal Experiments.*

My own experiments were related particularly to isolated loops of the lower part of the small intestine. Here one found that a loop, if isolated and closed empty, was quite compatible with life and health, and gradually filling with mucus might lie latent as a mucocele. If it contained a very small amount of fæcal matter when isolated it slowly filled with a purulent fluid; the health of the animal was to some extent interfered with and eventually perforation of the loop might occur with a fatal peritonitis. Sometimes, however, the animal would die of toxæmia before peritonitis had set in. If, however, the loop contained a considerable quantity of fæcal matter—especially if the animal had been previously fed on a rich protein diet—rapid putrefactive changes occurred in the loop; the latter became gangrenous, and animals frequently died before perforation or any gross degree of peritonitis had supervened. The importance of putrefactive changes occurring under and leading to tension within the loop was the vivid impression left by all such experiments. The similarity of the changes seen in these loops to those seen at operations for so-called appendicitis led one to distinguish a purely obstructive type of appendix lesion, a type which I now regard as a most important clinical entity.

#### *Obstruction More Serious than Inflammation of the Appendix Wall.*

The acute obstructive lesions of the appendix are to my mind infinitely more important than the acute inflammatory affections of its wall and are frequently neglected because in the early stages no rise of pulse-rate or of temperature occurs. Only by including this group among the varieties of acute intestinal obstruction can we hope to get that early diagnosis and prompt surgical treatment which are so vital for success. The main conclusion to be drawn with regard to closed intestinal loops is that the accumulation of intestinal content containing bacteria under tension in an isolated loop leads to toxic symptoms. If, however, the patient survives the toxæmia for any length of time, gangrene with perforation of the loop will probably determine the fatal issue.

### SIMPLE OBSTRUCTION OF THE INTESTINAL LUMEN IN ITS CONTINUITY.

This variety is met with in its purest form in gall-stone ileus, where a large calculus has ulcerated into the duodenum and, passing down the intestine, has become arrested in the narrow ileum and completely occluded its lumen. It is seen also when an adhesion or band has led to pressure on or kinking of a coil of small intestine, in acute gastro-mesenteric ileus, and also in the terminal acute obstruction so often met with in cases of carcinoma of the colon. Further, it is an accessory factor in practically all other varieties of intestinal obstruction. It is very doubtful if the many observations made on the experimental closed

loop are applicable to the conditions operative in this, the simplest variety of obstruction. With the conditions obtaining in this type surgeons have constantly to deal, and it is of first importance to investigate its harmful effects. In the first place it is established that the lower down in the alimentary canal is the obstruction the longer does the patient survive. High small-intestine obstruction is usually fatal in a few days, obstruction of the large intestine may be compatible with life for a period measured in weeks. In a series of experiments on cats I found that a complete obstruction in the upper reaches of the jejunum was usually fatal in four to five days and was associated with much vomiting; a similar obstruction in the lower ileum was survived for two weeks and vomiting was rarely met with except in the last days. Such animals would take food and apart from abdominal swelling and a certain listlessness would show no signs suggesting a complete intestinal obstruction. If killed at the end of two weeks post-mortem examination showed that the ileum for many inches above the obstruction was distended with inspissated fæcal matter.

Whilst in both high and low obstruction toxic absorption almost certainly played a part in bringing about the fatal issue, the contrast between the rapid course in the high and the slow course in the low obstruction appeared to depend to a large extent on the great loss of fluid in the former compared to the latter. Normally very large quantities of fluid are secreted in the upper reaches of the small intestine and re-absorbed lower down. When the obstruction is high this fluid is lost by vomiting, when it is low down the fluid is re-absorbed. In cats with high obstruction, by supplying fluid in the form of subcutaneous saline infusion, life could be prolonged for several days beyond that in control animals. In rabbits, to which animals a high small intestine obstruction is rapidly fatal, an enterostomy above the construction did not prolong life to any remarkable degree. Thus an obstruction at the duodeno-jejunal junction in a rabbit was fatal on an average in 17 hours, the same obstruction with duodenostomy was fatal in 36 hours, during which time the animal had lost one-third of its body-weight.

Such experiments impressed me with the great importance of dehydration as a factor in intestinal obstruction and particularly high intestinal obstruction, and the necessity of making good the fluid loss in our treatment of the condition. The subcutaneous administration of saline with glucose should form an essential part of all operations for acute intestinal obstruction. An interesting sidelight from experiments on high obstruction in cats and rabbits was the very rapid fatal result in the latter compared to the former. The rabbit, which does not vomit, dies in a state of what appears to be a combination of profound shock and toxæmia with great gastro-duodenal distension; the cat on the other hand vomits readily, its strong muscular stomach not tolerating distension, whilst shock is not a feature and toxæmia is gradual. The human subject seems to occupy an intermediate place, and hence in high obstruction obtains great relief and benefit from the passage of a stomach tube and the consequent lessening of upper abdominal distension, both shock and toxic absorption being diminished.

That a very potent toxic body is absorbed in high intestinal obstruction is not open to question. Further, it has been proved that it is of the nature of a proteose. As Sweet, Peet, and Hendrix have pointed out, only two digestive juices—the gastric and pancreatic ferments—can break up protein into proteose; of these two the latter is by far the more important. The intestinal juice contains only one proteolytic ferment—erepsin, which can digest proteoses into amino-acids but cannot break up proteins other than casein. It is obvious how, in addition to the loss of fluid involved in high intestinal obstruction, the damming up of the content at what may be called the "poisonous proteose level" is liable to be associated with profound intoxication.

Coming now to the somewhat vexed question of the toxicity of the intestinal content above a low small intestine obstruction (the common type in the human subject), if the pent-up intestinal content be highly toxic a natural inference will be that at operations for the relief of the obstruction this content must be evacuated, lest the poisoning continue or even become aggravated as the content enters the empty and absorptive reaches of the intestine below.

Experimental data brought forward by Dragstedt and others show that toxic cholines and amines are present in the pent-up content of the small intestine above an obstruction. When these poisons are introduced into the circulation of experimental animals certain very striking disturbances are produced. There is a rapid fall of blood pressure and of temperature, vomiting and diarrhœa, and the excretion of large amounts of fluid into the intestinal lumen, with the signs of extreme shock followed by death. Post mortem the intestinal mucosa is engorged, particularly in the duodenum and upper jejunum, and there is great congestion and vascular dilatation in the whole splanchnic area.

Much of the experimental work done on this subject has to my mind been unsatisfactory in so far as the toxicity of the content was tested by intravenous or intraperitoneal injection. What we wish to know is the extent of absorption of such toxic bodies as may be found above the obstruction. To obtain light on this question I carried out the following series of experiments. In eight animals the content from the obstructed small intestine of animals, dead from obstruction, was injected into the unobstructed small intestine. In no case were any symptoms of toxæmia apparent within the first 24 hours; two animals, however, developed an acute enteritis. I concluded that the normal intestinal mucosa offers an effective barrier to the rapid absorption of large quantities of the products of intestinal putrefaction, and that consequently no great harm is likely to accrue from the access of the content from above an obstruction to the bowel below, if its evacuation be not too long delayed. If, however, there be a breach of surface from ulceration of the protective mucous barrier toxic absorption will almost certainly occur.

Stone[9] suggests that when the toxic content from obstruction cases is introduced into normal intestine the toxins are absorbed. The first of this material absorbed, however, produces the effect of increased tone and peristalsis of the intestinal musculature such as occurs after the injection of histamine. This hurries on the bulk of the toxic material and not enough is absorbed to cause serious toxic symptoms. That this is not the whole truth I had already shown by the following group of experiments.

At the operation in which the intestine of the animal was obstructed I filled the intestine above the obstruction with the content from the bowel of another animal dead from obstruction. It had previously been shown that absorption of absorbable bodies by obstructed intestine is rapid in the early stages and slow in the later stages of an obstruction, and it was to be expected that in this group of animals very early evidences of toxæmia would be found; but actually, during the first 36 hours, the animals appeared well. A feature in this series of experiments was the great difficulty experienced in preventing peritonitis. Although the most scrupulous care was taken to prevent soiling of the peritoneum as the content was injected by a Record syringe and to prevent leakage afterwards by burying the puncture with Lembert sutures, the fatalities from peritonitis were numerous.

The impression left on one's mind was that the toxicity of the content of obstructed intestine, unless that content is retained in the higher reaches or under tension in bowel which cannot empty itself, either from mechanical obstruction beyond or from paresis of its wall, was not so great as one had previously believed, but that its infectivity was great. Consequently the routine practice of emptying the distended

bowel above an obstruction at the operation for the relief of the latter is of doubtful necessity and of considerable risk.

In actual surgical work I have based my practice on these findings and only when impelled by necessity (as in instances of enormous and crippling distension extending to the upper jejunal coils, or where resection of devitalised bowel is inevitable) do I open and drain the afferent bowel. On the other hand, death from what appears to be toxæmia from absorption may occur after the obstruction has been relieved, unless fairly rapid evacuation of the bowel is induced. All surgeons are familiar with the type of case where after a late operation for the relief of obstruction—e.g., a strangulated hernia or a stricture of the colon—the patient fails to respond and slowly emaciates, sinks, and dies, perhaps ten days after the operation, from what is to all appearances a low form of toxæmia. At the post-mortem on such a case it is seen that the bowel has never really emptied and regained its tone, and that the upper coils of jejunum are still twice the normal size and contain much stinking fluid content. A paresis of the jejunum, probably due to toxic involvement of the splanchnic nerves, leads to retention of toxic content and permits slow but progressive toxic absorption. This leads to further paresis at the "poisonous proteose level," and so a vicious circle is set up which if not broken inevitably ends in death.

It would appear that it is only when delay and retention tells back on the highest coils of the small intestine—i.e., on the "poisonous proteose level"—that the really serious symptoms supervene. If drainage of the intestine is considered necessary, it is these high jejunal coils which must be drained. That it is necessary to empty them to the exterior is, however, doubtful, except in late cases, and my practice is merely gently to milk the fluid content of the distended jejunal coils down into the gas-filled ileum below. Repeated injections of pituitrin followed by enemata will usually prevent the stasis and retention in the jejunum after the obstruction below has been removed. In late cases, however, especially in elderly subjects where the distension reaches up to and involves the highest loops of jejunum, it is good practice to drain the upper jejunal coils by performing a jejunostomy and later to use this opening to wash out this critical area of the bowel.

### ACUTE OBSTRUCTION IN PERITONITIS.

The part played by obstruction of the intestine in bringing about a fatal result in many cases of peritonitis has not, I think, even yet been sufficiently recognised. Some years ago, when working in the post-mortem room, I was struck by the fact that what was generally taken to be paralytic distension of the small intestine frequently proved, on careful examination, to be really an organic obstruction due to plastic adhesions in the pelvis. In experiments in rabbits I was able to show that plastic adhesions of less than 48 hours' duration may lead to fatal obstruction if unrelieved. In the human subject this type of obstruction is usually recognised clinically by the fact that the patient complains of spasmodic pains; it can frequently be treated successfully either by an enterostomy, opening the first distended coil of intestine which comes to hand, or, if the patient's condition permits, by opening the abdomen more freely, separating the adhesions, pouring in some oily substance to prevent immediate re-adhesion and then giving pituitrin. I have used sterilised vaseline oil repeatedly with success in such cases.

This type of obstruction has been described by Sampson Handley[12] as ileus duplex, as he believes that the pelvic colon as well as the small intestine is obstructed. If the small intestine be obstructed, however, an obstruction as low down as the pelvic colon, if it be present, is of relatively small consequence. The vital factor is the retention at the upper end of the small intestine, which must somehow be relieved, a fact which Victor Bonney[13] has done much to emphasise.

### ACUTE OBSTRUCTION FROM TUMOURS OF COLON.

Here we deal with the low variety of simple obstruction, where we find acute symptoms gradually supervening on a chronic obstruction. The age of the patient, the low site of the obstruction, and the nature of the disease all unite in determining that only a drainage operation is justifiable until the bowel is emptied. The benefits of a simple cæcostomy in such cases are too well known to require more than mention. The most encouraging results reported by Flint[14] in a long series of cases of acute obstruction, in which the principles of avoidance of shock, making good the fluid loss, and rapid and conservative operation were applied, is an evidence of the truth of the experimental data which I have referred to in this paper. I am very conscious of how crude much of what I may call purely surgical experimental investigation is and must be. We must look to the trained biochemist to give us more intimate knowledge of the poisons which we have to combat in this condition. Already we know from the work of McQuarrie and Whipple[15] that in intestinal obstruction there is a definite impairment of the kidney function as measured by the rise of the non-protein nitrogen of the blood, and that this renal impairment runs pari passu with the degree of intoxication. In this we may have an important means of determining the prognosis in a given case. This proof of renal insufficiency is also another indication for the generous exhibition of fluid in cases of obstruction.

Further studies on biochemical lines will, we hope, show more clearly what toxic product is present in the blood in acute intestinal toxæmia, and possibly how it may be neutralised and rendered harmless.

*References.*—1. Albeck: Arch. f. klin. Chir., Bd. lxv., 567. 2. Murphy and Vincent: Boston M. and S. J., 1911, cxlv., 684. 3. Stone, Bernheim, and Whipple: Johns Hopkins Hosp. Bull., 1912, xxiii., 160. 4. Dragstedt: J. Exp. Med., 1919, xxx., 109. 5. Brooks: Ann. Surg., 1918, lxvii., 210. 6. Davis and Stone: J. Exp. Med., 1917, xxv. 7. Sweet, Peet, and Hendrix: Ann. of Surg., 1916, vol. lxiii., p. 720. 8. Wilkie: Brit. Med. Jour., 1914, ii., 959. 9. Stone: Surg., Gyn., and Obst., 1921, xxxii., 415. 10. Wilkie: Brit. Med. Jour., 1913, ii., 1064. 11. Wilkie: Surg., Gyn., and Obst., 1910, February, 126. 12. Handley, Sampson: THE LANCET, 1915, i., 900. 13. Bonney, Victor: Brit. Med. Jour., 1916, i., 583. 14. Flint: Brit. Med. Jour., 1921, i., 729. 15. McQuarrie and Whipple: J. Exp. Med., 1919, xxix., 397.

## ON CERTAIN CONDITIONS ASSOCIATED WITH DEFICIENT SECRETION IN THE UPPER ALIMENTARY TRACT.*

BY T. IZOD BENNETT, M.D., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, MIDDLESEX HOSPITAL; BEIT MEMORIAL FELLOW FOR MEDICAL RESEARCH;
AND
E. C. DODDS, M.R.C.S.,
CHEMICAL PATHOLOGIST AND LECTURER ON BIOCHEMISTRY, MIDDLESEX HOSPITAL; PATHOLOGIST, ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.
(*From the Bland-Sutton Institute of Pathology, Middlesex Hospital.*)

THE increasing employment of laboratory methods in the investigation of alimentary disorders has led to the discovery of diminished secretion of the digestive glands in a great variety of pathological conditions. The perhaps unfortunate introduction of the term achylia gastrica by Einhorn[1] has created the widespread impression that the absence of active gastric secretion should be recognised as a pathological entity, and although added interest in the subject has been aroused, it is doubtful whether much clear

* Part of a communication to the Section of Medicine of the Royal Society of Medicine. The respiratory observations form part of a report to the Medical Research Council. The expenses incurred by one of us (T. I. B.) in connexion with this work have been partly defrayed by a Government grant made through the Royal Society.

knowledge has yet been acquired concerning its importance. By reviewing a large number of observations made by us during the past three years, we hope to throw light on certain aspects of these obscure problems. Without claiming any finality for our work, we attempt a classification of some of the more important conditions of hyposecretion in the upper alimentary tract.

### 1. "*Physiological*" *Achylia Gastrica.*

It must, in the first place, be recognised that many people apparently in perfect health have no secretion of gastric HCl, and consequently no active proteolytic ferments in their gastric juice. As far as we could ascertain, the first description of such a case was published[2] by one of us in THE LANCET; subsequently this case, with three similar ones, was collected in the series of 100 normal men examined by fractional gastric analysis by Dr. J. A. Ryle and one of the writers. In that study[3] all the cases examined were in good health, without sign or symptom of previous illness; three others in whom achylia gastrica was present were perfectly well, but gave a history of previous illness, and were rejected from the final series. It is noteworthy that in other series of cases, supposedly representative of the normal stomach, examined by gastric analysis, such figures do not occur; but the explanation is fairly obvious—it is easy on discovering achylia to assume that this must be a pathological condition. Thus the series of Crohn and Reiss[4] was derived from patients with mild dyspeptic symptoms and no sign of organic disease; the natural impulse on finding achylia in such patients is to accept it as evidence of organic trouble, and so no cases of achlorhydria were included. Again, Homer Wheelon[5] recently recorded his findings in "61 normal men and three with achylia gastrica"; he does not state whether any evidence of abnormality beyond the achylia was present in these three. We have not encountered a case of complete achylia gastrica in a patient previously proven to have had a secretion of HCl, but the greater frequency with which it is encountered in elderly patients suggests that it is sometimes the result of a degeneration. It is at present impossible to prove this, however; we feel that the important thing to realise is that in *young healthy adults achylia gastrica is about as common as red hair*, and we have no convincing evidence that it is of serious pathological import.

### 2. *The Relation of Achylia Gastrica to Dyspepsia.*

If the above conclusion be accepted, it must still be conceded that the number of patients suffering from "dyspepsia" or "indigestion" in whom one discovers achylia is strikingly high, and that in such cases the precentage of achylia seems higher than in health. However this may be, laboratory examination of such patients usually fails to reveal any factor differing from those seen in healthy subjects who have achylia. In Fig. 2, for example, are seen the results given by fractional gastric analysis of a subject with achylia gastrica who complained of flatulence and discomfort in the upper abdomen some hours after food. Comparing this figure with Fig. 1, which shows the condition revealed in the majority of healthy subjects, it will be seen that in achylia there is no free HCl in the gastric juice, that the total acidity is also remarkably low, that the stomach empties more rapidly than usual, while the curve of alveolar $CO_2$ tension in the upper part of the same figure shows that the rise in tension which normally occurs after a meal is absent, whereas the later fall is present. We have shown elsewhere[6] that this rise is due to the secretion of acid by the stomach, whereas the fall is due to secretion of alkali into the duodenum.

In ordinary benign achylia gastrica there is, then, an absence of gastric secretion without disturbance of the secretion below the pylorus, there is an increased rapidity of the gastric emptying, but there is no grave disturbance of digestion and there may be no symptoms of ill-health. It is noticeable that dyspeptics in this group usually put forward flatulence as a predominant symptom; it is probable that in rapidly emptying stomachs of this as of other classes, the normal hunger-contractions appear more readily and rapidly, and that these are dealt with by the subject by unconscious aerophagy, the subsequent flatulence being the common fate of all air-swallowers.

We have in rare instances encountered dyspeptics in whom in addition to absent HCl there was an abundant secretion of mucus; separating these from cases of carcinoma, which will be found dealt with later, we believe that these are examples of a true gastritis. Should a chronic inflammatory process attack a gastric mucosa, an interference with secretion, and possibly a complete achylia, would follow; it is certainly true, however, that such a process is rare, and when the relative rarity of chronic stomatitis and chronic colitis are remembered may it not be that the stomach wall is even more immune from such changes? When such a gastritis, with achylia, is encountered, it is, we believe, not infrequently secondary to a chronic infection of the lungs or nasopharynx, and should be treated by attacking such primary sources of sepsis; for local treatment alkaline drinks, which will help the removal of mucus, are more valuable than acids. A second rare group of achlorhydric dyspeptics consists of cases where achylia is accompanied by delayed emptying of the stomach; in one such case we were even able to recover gastric contents which had been present for over ten hours; there was not the slightest suspicion of malignant disease in this case, and the delay appeared to be due to extreme visceroptosis affecting both stomach and intestines.

### 3. *Pancreatic Hyposecretion.*

Conditions of pancreatic insufficiency are at present ill-defined, and examples are rare; we have, however, been able to obtain data from one established case which are reproduced for comparison in Fig. 3. The patient was a man who had suffered from an acute febrile illness, which had left him with a chronic abdominal disturbance characterised by discomfort, flatulence, and attacks of diarrhœa. For four years he had been unable to digest fats, the stools contained unsplit fat and meat fibres. A laparotomy three years before our examination revealed a fibrotic condition of the pancreas. The alveolar $CO_2$ examination, illustrated on Fig. 3, shows a diminished gastric rise, and a pancreatic fall which is so low as to be almost within the limits of experimental error. Cases of pancreatitis are usually so ill that it is not possible to obtain reliable data of this sort from them; we regard this case as valuable in that the patient's general health was very fair at the time of examination, and there can be no doubt as to the clinical diagnosis.

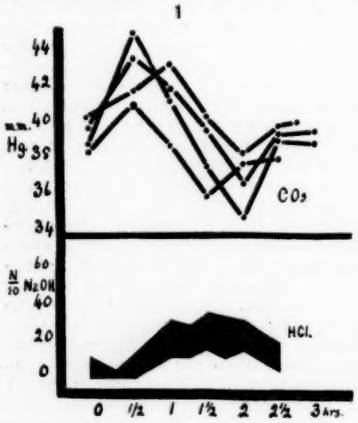
### 4. *Gastro-Pancreatic Hyposecretion of Hæmatogenous Origin.*

The observation that pernicious anæmia is frequently associated with achlorhydria dates from the original descriptions of Austin Flint,[7] Samuel Fenwick,[8] and Schumann.[9] Since that time evidence has steadily accumulated until it is now generally acknowledged that pernicious anæmia is more frequently than not associated with a failure of gastric secretion. Among the more important recent series of cases bearing on this question are those of Cabot[10] and Friedenwald and Morrison[11]; the former found free HCl present in the gastric contents in only one of a series of 79 cases, the latter writers found achylia gastrica in 74 per cent. of a series of 76 such patients. Clinicians and pathologists are, as a whole, in general agreement with these findings, and many of them consider that a gastric lesion plays an important part in the pathogenesis of the disease. In 1887 Fenwick described atrophy of the gastric tubules, an observation which was confirmed by Quincke,[12] Nothnagel,[13] Oestrich and Strauss,[14] Martius,[15] and many

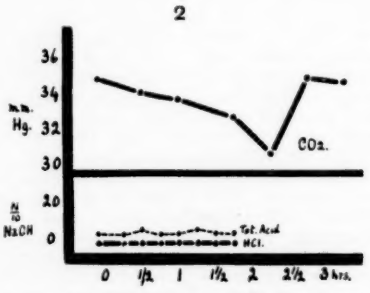
others. There has been a marked tendency amongst pathologists to consider the anæmia as in some way following this gastric degeneration; the compatibility of achylia with good health makes it difficult to imagine that the anæmia merely follows a breach in the resisting wall which the normal mucosa presents, and the modern view has been more commonly to suggest the presence of some toxic agent which attacks simultaneously the blood elements and the gastric glands.

We wish to put forward a suggestion differing fundamentally from those above; it is that the hypotension depend upon the close relation between blood and secretion. The second becomes apparent from examination of any large series of cases of pernicious anæmia; diarrhœa is a common symptom, occurring 27 times in the series of 76 cases recorded by Friedenwald and Morrison,[11] as an occasional symptom it occurs in an even higher percentage of cases, and in terminal cases it affects the majority. Unsplit fat and meat fibres are found with some frequency in the fæces of pernicious anæmia cases.

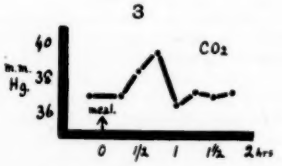
In Fig. 4 are the curves of gastric acidity and $CO_2$ tension following test-meals, in a series of cases of



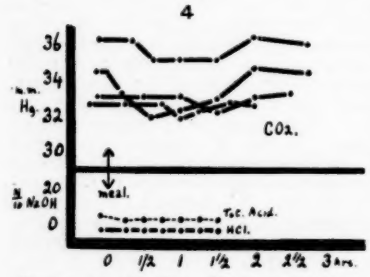

Curves of alveolar $CO_2$ tension and of gastric acidity (free HCl) from normal subjects of the usual type. The black area represents the area within which fall the readings of free HCl on fractional gastric analysis in the majority of healthy men.



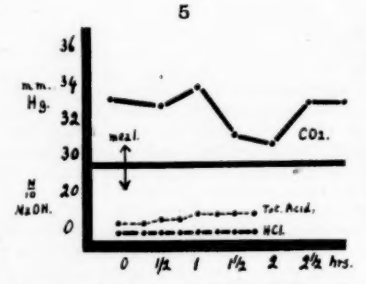

Curves of alveolar $CO_2$ tension and of gastric acidity from a case of benign achylia gastrica. Note rapid emptying of stomach. A similar picture is given by healthy subjects with achylia.



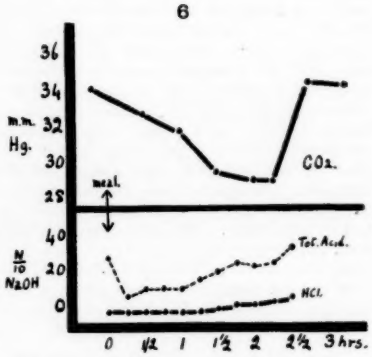

Curve of alveolar $CO_2$ tension from a patient with pancreatic sclerosis and insufficiency; gastric rise low, pancreatic fall very slight.




Curves of alveolar $CO_2$ tension and gastric acidity from four typical cases of pernicious anæmia.




Curves of alveolar $CO_2$ tension and gastric acidity from a patient with severe secondary anæmia.




Curves of alveolar $CO_2$ tension and gastric acidity from a patient with carcinoma of the stomach causing pyloric obstruction. The total acidity on gastric analysis was high, but was much higher before the stomach had been washed out.

secretion seen in pernicious anæmia is entirely secondary to the anæmia itself. We have been driven to this conclusion on account of the following facts:—

1. The elements which constitute the secretions of the glands of the alimentary canal are derived from the blood-stream; a radical alteration in the constitution of the blood may therefore produce a radical alteration in alimentary secretions.

2. Patients suffering from pernicious anæmia almost invariably show complete achlorhydria; many of them show, in addition, a disturbance of digestion suggestive of pancreatic insufficiency.

3. The curve of alveolar $CO_2$ tension in patients suffering from pernicious anæmia is markedly different from that given by a healthy man with achylia gastrica, the difference being of a type suggesting that the pancreas as well as the stomach is involved.

4. Patients with anæmias other than of the pernicious type show, to a lesser degree, similar abnormalities in their curves of alveolar $CO_2$ tension.

5. The microscopic changes in the glands, seen post mortem, are compatible with a mere disuse atrophy.

The first of these contentions is, we believe, self-evident; the normal fluctuations in alveolar $CO_2$ pernicious anæmia. All the patients were typical clinical cases of the disease, the blood pictures, with high colour-index and cell changes, being diagnostic of the condition. The gastric analysis differs in no way from that seen in cases of benign achylia such as we have described in an earlier section. The curves of $CO_2$ tension differ remarkably from such cases in that the pancreatic fall is absent to a degree almost as great as that of the absence of gastric rise. Comparison with Fig. 2 makes this apparent. It was this distinction between the hyposecretion of achylia gastrica and that of pernicious anæmia which first impressed upon us the fact that there must be some radical difference between the pathogenesis of the two conditions.

Study of the secretory pictures in other anæmias confirms our belief in the hæmatogenous origin of the hyposecretion of pernicious anæmia. Fig. 5 gives the curves obtained from a very severe secondary anæmia. The patient had experienced severe hæmorrhage, due to uterine fibrosis, for many months; at the time of observation the hæmorrhage had ceased, but the patient remained blanched and weak; the blood picture was that of a severe secondary anæmia, with great reduction in the number of corpuscles

and amount of hæmoglobin, and a low colour-index; the subsequent maintained improvement in the patient's condition confirmed the diagnosis. It will be seen that gastric analysis shows an entire absence of free HCl, but the rise in total acidity towards the end of gastric digestion suggests that small quantities of HCl were being evolved. The $CO_2$ tension curve shows a gastric rise and a pancreatic fall much smaller in degree than those seen in normals, the pancreatic fall being also much smaller than that seen in cases of benign achylia gastrica. (Compare Figs. 1 and 2.) A further confirmation of these views has been given us by our friend Dr. Charles Miller of the London Hospital. Examining patients with gastric ulcer who have recently had a severe hæmatemesis he has observed that in such cases the gastric secretion is always notably diminished and in many cases absent.

An interesting case bearing on this subject was recently recorded in THE LANCET by Prof. Valdemar Bie,[16] of Copenhagen. His patient, a doctor, had been known to have achylia gastrica for 14 years, and later developed a severe anæmia. Prof. Bie achieved a most brilliant cure in this case by treatment with large doses of HCl. We do not feel that this in any way disturbs our belief; the history makes it clear that there was pancreatic insufficiency in this subject, his anæmia, apart from the colour-index, was not of the pernicious type, nor is there reason to suppose that patients with hyposecretion are more immune from severe anæmias than persons of the more usual type. The whole point at issue is whether achylia gastrica normally precedes pernicious anæmia, or whether the achylia of this disease is secondary to the blood condition; we hold to the latter view. It is interesting to note that Fenwick's original notes[8] on anæmia and gastric atrophy were derived from observation of cases with cancer; we would here emphasise our opinion that it is the anæmia which accompanies carcinoma of the stomach which is often responsible for the hyposecretion so frequently associated with that condition. There are other causes of malignant achylia to which we shall subsequently refer; for the moment we would repeat our conviction that hyposecretion is frequently of hæmatogenous origin, and that under such circumstances it affects both the acid secretion of the stomach and the alkaline secretion of the pancreas.

### 5. *Malignant Achylia.*

It is a remarkable fact that the two diseases which have chiefly directed attention to gastric analysis—namely, gastric ulcer and gastric cancer—have neither of them more than an indirect effect upon gastric secretion. In gastric carcinoma there are several different types of response to laboratory tests, none of them peculiar to carcinoma. The commonest site of gastric cancer is in the neighbourhood of the pylorus, and just as the symptoms and signs of this variety are those of pyloric obstruction, so the laboratory findings in such cases are those of a high degree of pyloric blockage. Fig. 6 shows our findings on gastric analysis and alveolar $CO_2$ estimation in such a case; the alveolar $CO_2$ curve shows merely achylia gastrica, with a pancreatic fall of normal depth, the whole secreting picture being unduly prolonged owing to pyloric obstruction. The fractional gastric analysis showed a fasting gastric content containing dark, foul, food residue and mucus, with no free HCl and a high total acidity. The specimens obtained after the test-meal showed a lower total acidity which was, however, still markedly higher than the free HCl, which only appeared in the last specimens.

It must be emphasised that these findings are all of them merely the result of pyloric obstruction, the high total acidity being the effect of bacterial action on retained food and gastric secretion, the delayed emptying of the stomach being self-evident, and the Opler-Boas bacillus, which can usually be recovered readily, being a further effect of retention. Further, we have been impressed by the fact that the achlorhydria usually present in such cases is often merely the result of the coating of a more or less normal mucosa with foul retention products; by removing the fasting content, washing the stomach thoroughly with weak alkali, putting the patient on water only for 24 hours, then washing the stomach again and giving a test-meal, we have several times succeeded in obtaining a free secretion of HCl with a low total acidity in such cases, the extreme delay in emptying will, of course, persist. Preliminary observations tend to show that the varieties in total and mineral chlorides, supposed to be diagnostic of gastric carcinoma, are again merely effects of pyloric blockage.

Apart from carcinoma in the pyloric region we have encountered only one condition which can give rise to a similar picture—namely, gummatous tumefaction near the pylorus; this rare disease can only be diagnosed from cancer by its naked-eye appearance and by the effects of treatment. If it can be excluded then the picture we have given above may be accepted as indicating carcinoma. But though the above is the commonest type of cancer of the stomach, the obstructive picture is probably a fairly late phenomenon, and earlier cases and ones in a different situation present greater diagnostic difficulties. It is possible to separate off another group in whom there is an achylia partly, at least, of hæmatogenous origin. These cases give a picture not differing from that shown in Fig. 4; the subjects are cachectic, and it is often impossible to say that the secretory changes are other than those of cachexia. A similar picture may be observed in chronic Bright's disease or advanced tuberculosis. Again, there are a few cases, also with achylia, in whom gastric tubage produces evidence of an extreme secretion of mucus; we have occasionally seen a case in whom after a test-meal we were unable to recover more than large amounts of blood-stained mucus in each specimen; it is clear that this mucus will rapidly mop up any HCl that may be secreted. Such cases, we believe, to be invariably malignant.

Lastly, there are a certain number of cases of carcinoma in whom we have found a picture almost indistinguishable from benign achylia. In the great majority of these there has been one point which has helped diagnosis, the macroscopic appearance of the fasting gastric content. HCl has been absent in this and later specimens, the total acidity has been low, the $CO_2$ curve that of an ordinary benign achylia, but with the mucus and clear fluid of the fasting stomach content there has been a certain amount of brown or red staining, indicating hæmorrhage some hours previously. The condition almost defies definition; microscopic and chemical examinations have given us no further assistance, but we would stress the importance of this appearance of the "resting-juice," for we have frequently found it the one point of diagnostic importance in deciding whether an achylia is benign or malignant.

### *Summary.*

1. Complete absence of gastric HCl, and hence of active gastric ferments, is frequently encountered in healthy persons.

2. A precisely similar phenomenon is frequently seen in dyspeptic subjects. The increased rapidity of gastric emptying in such cases may be the cause of increased hunger contractions, aerophagy, and flatulence.

3. In rare cases an increased secretion of mucus is seen in such subjects; this is sometimes an indication of true gastritis and may be secondary to a pulmonary or naso-pharyngeal infection.

4. In other rare cases of achylia there is delayed gastric emptying; in such subjects there is usually marked visceroptosis.

5. In a patient proven to have pancreatic sclerosis, the fall of alveolar $CO_2$ tension, which normally occurs on the passage of food through the pylorus, was absent.

6. In patients suffering from pernicious anæmia there is, in addition to complete achylia gastrica, a marked diminution in the "pancreatic fall" of alveolar $CO_2$ tension.

7. Such patients have clinically been shown frequently to have signs of pancreatic insufficiency.

8. Similar pictures of alveolar $CO_2$ tension and achlorhydria have been found in severe secondary anæmias and cachectic conditions.

9. The writers believe that the achylia of pernicious anæmia is secondary to the blood condition.

10. At least four types of picture are given by the laboratory examination of cases of gastric carcinoma. (*a*) A type characteristic of extreme pyloric stenosis. (*b*) A type characteristic of cachexia. (*c*) A type with excessive secretion of mucus. (*d*) A type difficult to distinguish from benign achylia.

We wish to express our thanks to our colleagues on the staff of the Middlesex Hospital and its Medical School for much help on the preparation of this work, and in allowing us facilities for investigating cases under their care.

*References.*—1. Einhorn, M.: N.Y. Med. Rec., June, 1892. 2. Bennett, T. Izod: THE LANCET, 1920, ii., 1196. 3. Bennett and Ryle, J. A.: Guy's Hosp. Rep., 1921, lxxi., 286. 4. Crohn, B. B., and Reiss, J.: Amer. Jour. Med. Sci., 1917, cliv., 857. 5. Wheelon, Homer: Arch. Int. Med., 1921, xxvii., 613. 6. Bennett and Dodds, E. C.: Brit. Jour. Exper. Path., 1921, ii., 58; Internat. Jour. Gastr. Enter., 1921, i., 121; Brit. Med. Jour., Jan. 7th, 1922. 7. Flint, A.: Med. Times, Sept. 15th, 1860. 8. Fenwick, S.: Med. Chir. Tr., xlviii. 9. Schumann: Inaug. Diss. Freiburg, 1875. 10. Cabot: Osler and McCrae's Modern Medicine, iv., 627. 11. Friedenwald, J., and Morrison, T. H.: Jour. Amer. Med. Assoc., 1919, lxxiii., 407. 12. Quincke.: Samml. Klin. Vortr., No. 100. 13. Nothnagel, C. W. H.: Deut. Arch. f. Klin. Med., xxiv. 14. Strauss, H.: Berl. Klin. Woch., 1902. 15. Martius and Lubarsch: Achylia Gastrica, 1897. 16. Bie, Valdemar: THE LANCET, 1922, i., 631.

# NITROUS ACID POISONING.

BY W. ST. CLAIR McCLURE, M.R.C.S., L.R.C.P. LOND., D.P.H.,
ACTING MEDICAL OFFICER OF HEALTH, MANCHESTER;
AND
HARRI HEAP, M.Sc., F.I.C.,
PUBLIC HEALTH LABORATORY, MANCHESTER UNIVERSITY.

THE following is an account of the accidental poisoning of six persons by nitrous acid caused by the inadvertent admixture of sodium nitrite with their food.

On the evening of Sunday, April 23rd, a family was removed to the Royal Infirmary supposed to be suffering from food poisoning. The family consisted of the mother, aged 38 years, M. 17 years, F. 15 years, F. 9 years, M. 8 years, and Mr. A., the lodger, aged 30 years. In the morning they were in their usual health. All except the lodger had breakfast at 9 o'clock. The mother and M. 17 had scrambled eggs, bread, tea and milk and sugar. F. 15, F. 9, and M. 8 had toasted muffins, margarine, and tea. The lodger had breakfast a little later, which consisted of liver, an onion, bread, margarine, cocoa, milk, and sugar. The mother fried the liver in a metal pan and sprinkled upon it, whilst cooking, about half a teaspoonful of some powder which she thought was common salt. This powder was in a blue packet found in a cupboard and had been left by a former tenant. The lodger complained of the taste of the liver but ate it all. He then went for a walk and, feeling sick, he pushed his finger into his throat and vomited. When he returned he looked flushed in the face and felt unwell. All the others up to this time and until after dinner were quite well.

*Sunday Dinner.*—About 10 A.M. the mother began to make a potato pie out of flour, suet, lard, rabbit, mutton, and potato. Into this pie she mixed about two tablespoonfuls of the powder out of the same blue packet from which she had taken the "salt" for the lodger's breakfast. About the same time she also made some meat pies of pastry, mutton, rabbit, and also a tomato and cheese pasty and some salad, into all of which some of the supposed salt was mixed. She thinks she would use about a teaspoonful of the "salt" to each of the pies. All sat down to dinner at 1.30 P.M and ate potato pie which did not taste nice. Shortly before their own dinner the mother sent the tomato and cheese pasty to a neighbour, Mrs. W., who tasted it and spat it out. When the family found that the pie was distasteful, but before their urgent symptoms ensued, they sent two meat pies to a neighbour, Mrs. B., for her dog and cat, both of which ate some.

*Ill-effects.*—Mrs. W., the neighbour who but tasted and spat out the pie suffered no ill-effect. The lodger who ate two dessertspoonfuls and almost immediately vomited was slightly ill. M. 17 was only slightly ill and did not vomit for an hour after eating. The mother and the two young children were taken ill with urgent symptoms within a quarter of an hour of eating and they were removed to and kept in the Manchester Royal Infirmary. The dog, a small pom, was taken ill, whimpered and vomited. It was taken to a veterinary surgeon and recovered by the evening. The cat did not vomit and died within 15 minutes of eating.

*Symptoms.*—The symptoms were the same in all, but varied in degree. The first signs of illness appeared between 15 and 30 minutes after eating. The mother at first felt dizzy and "swimmy," with a great "flushing and throbbing" of the head. She had difficulty in breathing as if she was being stifled, there was slight pain in the stomach, and a feeling of nausea though she did not vomit. F. 15 felt much the same, but the pains in her stomach were more severe and she vomited. M. 17 and the lodger were only slightly ill, the lodger being the worse, as he had hardly recovered from the dose he got at breakfast. The two younger children went "all colours" and vomited. Within half an hour they could not stand and were almost unconscious. On admission to the Manchester Royal Infirmary within about two hours of the onset, Dr. N. Kletz, the resident medical officer, states that the mother and children all showed a well-marked greyish blue colour of the face and lips. In the mother and the two elder children this was definite, although the general symptoms were slight. In the case of the two younger children, the appearance was much more marked and, associated with it, there was stupor and collapse. No pain was complained of; there was no diarrhœa.

*Duration of Illness.*—M. 17 and the lodger were not kept in the infirmary. The mother remained in for two days, F. 15 four days, M. 8 and F. 9 five days. They all recovered, but two weeks afterwards the mother, F. 15, and F. 9, complained of a feeling of weakness in their legs.

*Illness of the Cat.*—As already stated the cat was taken ill within 15 minutes of eating and died almost at once. The weight of the cat was 470 g. 0·027 gr. of sodium nitrite was recovered from its stomach. The blood was of a pinkish-brown colour and on examination, direct and after reduction, showed absorption spectra which are given by nitric oxide hæmoglobin.

*Amount of Contaminated Food in the House.*—There was found in the house over 9 kg. of food, all of which contained varying amounts of sodium nitrite as set out in the report hereafter.

*Amount of Food Eaten.*—At the Sunday dinner, which was the offending meal, only the meat and potato pie (sample 5) and a few peas were eaten. The amount eaten by each member of the family can only be estimated from a statement by the mother and is given hereunder. By experiment, a tablespoonful of potato, slightly heaped, was found to weigh 57 g.

| | | | | |
|---|---|---|---|---|
| M. 8 | .. | 6 tablespoonfuls | weighing | 342 g. |
| F. 9 | .. | 5 ,, | ,, | 285 ,, |
| F. 15 | .. | 4 ,, | ,, | 228 ,, |
| M. 17 | .. | 1 ,, | ,, | 57 ,, |
| Mother 38 | | 4 ,, | ,, | 228 ,, |
| Lodger 30 | | 1 ,, | ,, | 57 ,, |

No account is taken of the peas as it is doubtful whether they were separately contaminated.

*Amount of Sodium Nitrite Consumed.*—Sample 5 weighed 1800 g. and contained 1·38 g. as sodium nitrite. Granted that the salt was evenly distributed, 50 g. of the food would contain 0·038 g. of nitrite and the dose in each case may be estimated as follows:—M. 8, 0·26 g.; F. 9, 0·22 g.; F. 15, 0·17 g.

M. 17, 0·04 g.; mother 38, 0·17 g.; lodger 30, 0·04 g. The cat and the dog are said to have eaten a quarter of a pasty (sample 4). A pasty similar to the one eaten weighed 590 g. and contained 0·55 g. of nitrite. Consequently, each animal consumed about 148 g. of the pasty, which probably contained about 0·14 g. of nitrite. The cat weighed 470 g.; therefore in this case 0·30 g. of sodium nitrite per kg. proved fatal. It seems probable that the estimated doses were a little, but not very much greater than is here indicated.

*Severity of Illness.*—It is of interest to note that the severity of illness varied according to the body-weight of the recipient and the associated dose. The cat died, the dog was very ill and was thought likely to die, but recovered. The two younger children were severely ill and the issue was at first doubtful; the mother and F. 15 were only slightly ill, but were bad enough to be retained in hospital. M. 17 and the lodger suffered little more than some indisposition, the illness in the case of the lodger being due chiefly to his dose at breakfast.

*Origin of the "Salt."*—The tenant who left the "salt" in the house was traced. It appears that he obtained the "salt" from his employer, who was a gardener, as a plant food for an aspidistra. It proved unsuccessful, and was left lying in the cupboard where it was subsequently found and used, in error, by the mother.

*Nature of the Salt.*—The salt proved to be sodium nitrite and sufficient quantity was found in the food to account for the symptoms of illness which ensued when it was consumed.

The whole of the examination of the suspected materials was carried out by Mr. Harri Heap, of the Public Health Laboratory, Manchester University.

### *Report by* Mr. HEAP.

On April 21th, 1922, I received from Dr. McClure a collection of food specimens and a dead kitten for examination. There were 12 different specimens, and these are referred to later. I made an interim report on April 26th, dealing with the first four specimens as follows:—

*Basket.*—The powder recovered from the basket weighed 2·3 gr. It consisted of sucrose and sodium nitrite chiefly.

*Pie.*—The pie showed the presence of large amounts of nitrite.

*Dead Cat.*—The stomach contents of the cat showed the presence of large amounts of nitrite.

*Pan.*—The stew of mutton and rabbit also showed large amounts of nitrite.

*Conclusion.*—Nitrous acid poisoning.

The details of the complete examination are as follows:—

*Specimen No.* 1.—An ordinary wicker basket showing evidence of fair usage. In the framework of the basket were a few crystals which apparently had been spilled. These were dusted off and collected. They weighed 2·3 gr. and, of this amount, 0·9 gr. was sodium nitrite.

2.—A dead kitten weighing 470 g. The contents of its stomach were found to contain 0·027 gr. of nitrite as sodium nitrite. The blood was of a pinkish-brown colour and on examination direct, and after reduction, showed absorption spectra which are given by nitric oxide hæmoglobin.

3.—A large pan containing a cooked stew of mutton and rabbit, which weighed 2600 g. This contained nitrites equal to 0·80 g. as sodium nitrite.

4.—Two cooked pastry pies on dishes weighing respectively 510 and 590 g. They both contained nitrites, and the latter was found to contain 0·55 g. as sodium nitrite.

5.—A cooked mutton and potato pie in a large earthenware mug and covered with a crust. It weighed 1800 g. and was found to contain nitrites equal to 1·38 g. as sodium nitrite.

6.—A plate containing cooked meat, potatoes, and peas. These weighed 400 g. together and contained nitrites equal to 0·027 g. as sodium nitrite.

7.—A plate of cooked potatoes and peas together weighing 420 g. These contained nitrites equal to 0·069 g. as sodium nitrite.

8.—An uncooked pudding mixture of dates, citrus fruit peels, and suet weighing 1500 g. It contained nitrites equal to 1·04 g. as sodium nitrite.

9.—A mixed salad of beetroots, spring onions, watercress, oil, and vinegar. It was of a yellowish-brown colour and weighed 570 g. It contained nitrites equal to 1·17 g. as sodium nitrite.

10.—A cooked sago and milk pudding weighing 1020 g. It contained nitrites equal to 1·20 g. as sodium nitrite.

11.—A dish of sliced cooked beetroots weighing 390 g. It contained a marked amount of nitrites.

12.—A small portion of cooked mutton and rabbit which was not examined.

The specimens 3, 4, 5, and 10 were examined for the presence of poisonous metals and none were found. From the previously stated results I am of opinion that the poisonous substance present was sodium nitrite. This would produce the so-called "nitrite" or "nitrous acid" poisoning. The reason why the kitten died is explained by the ratio between the dose of nitrite taken and its body-weight. If more nitrite had been present in the food, or more food had been eaten, it is probable that those who consumed the food would have suffered a fate similar to that of the kitten.

## COMPLEMENT FIXATION IN GONORRHŒA:

### A SERIES OF 1000 TESTS.

BY T. E. OSMOND, M.B. CAMB.,
PATHOLOGIST IN CHARGE LABORATORY, V.D. DEPARTMENT, ST. THOMAS'S HOSPITAL.

TESTS of cure in cases of gonorrhœa, however carefully and conscientiously carried out, are very unsatisfactory, and the diagnosis of this disease in women, especially in chronic cases, is notoriously difficult. The complement-fixation test does not seem to have received the recognition it deserves in this country, though notable work on the subject has been done by L. W. Harrison,[1] J. E. R. McDonagh and B. G. Klein,[2] H. B. F. Dixon and A. H. Priestley,[3] W. Magner,[4] D. Thomson,[5] and others. I consider its value in diagnosis at least as great as that of the Wassermann reaction in syphilis, yet its routine use must be very much less common. In my experience the reaction becomes positive earlier in the disease than does the Wassermann in syphilis, and it does not tend to disappear as a result of treatment till some time after the disease is cured. The literature contains little information on the results of tests in women; it is especially in these cases that the complement-fixation test seems likely to be most useful, since diagnosis by other means is often very uncertain. In the average clinic the percentage of all cases of clinical gonorrhœa in women in which gonococci can be demonstrated must be very small.

### *Circumstances of the Tests.*

The tests recorded below were done on patients attending the venereal diseases clinic at St. Thomas's Hospital during the last 12 months. The male cases were principally those in which diagnosis was not clear, the minority being cases of early gonorrhœa in which gonococci were demonstrated; the complement-fixation test was carried out in the latter to ascertain how early in the disease a positive result could be obtained. As regards the females, the complement-fixation test, in addition to a complete clinical and bacteriological examination, is carried out as a routine measure on every new patient, and cases were therefore taken seriatim. The tests include those on 300 sera from males and 700 sera from females.

### *Technique.*

The technique followed was, in the main, that described by Thomson.[5] The patient's serum was heated for ½ hour at 56° C. and diluted 1/9; guinea-pig's serum was used as complement; this was titrated out immediately before putting up the test proper, and used in strengths of 3 and 4 minimum hæmolytic doses (M.H.D.). The hæmolytic system was 3 per cent. sheep's cells sensitised with 5 M.H.D. of amboceptor as for the Wassermann-test method No. 1. The antigen was prepared from a large number of strains of gonococci (as many as 26 in one case). The method employed was to grow the gonococci for

24 hours, using strains as recently isolated as possible, on nutrient hydrocele agar (reaction $P_H$ 7·5), and to wash the growth off with phosphate carbolic solution (0·5 per cent. $NaH_2PO_4$ and 0·5 per cent. carbolic). When a thick suspension had been thus obtained it was centrifuged, the supernatant fluid discarded, and the deposit dissolved in N/10 sodium hydroxide, and neutralised with N/10 hydrochloric acid, the resultant solution being very slightly opalescent. Antigen thus prepared apparently remains stable and retains its antigenic properties for many months when kept stored in the ice-chest. For use the antigen is diluted with physiological saline, and the amount used in the test proper is not more than half that which just failed to fix 3 M.H.D. of complement in the presence of a number of normal sera. This antigen is only very slightly anticomplementary; complement titrated alone and with antigen (incubated in the ice-chest as in the test proper) giving almost identical readings.

### *The Test Proper.*

Three tubes are set out for each test. The first receives patient's heated serum, complement 3 M.H.D., and antigen, one volume of each in the necessary dilution. The second receives serum and antigen as in the first, but 4 M.H.D. of complement. The third receives serum and complement like the first but *no* antigen, one volume of saline being added instead; this tube acts as the "serum control." In addition, known positive and negative sera are included as controls; also an antigen control containing antigen and complement, but no patient's serum. The whole series is then placed in the ice-chest (at about 4–8° C.) for 18–20 hours, and at the end of that time one volume of sensitised cells is added to each tube. The tests are then incubated in a water-bath at 37° C. and the results read as soon as all the serum controls, and the known negative and antigen controls show complete hæmolysis (the positive control showing no hæmolysis), usually after about 15 minutes, and again at the end of half an hour.

It is important to watch the serum controls very carefully; any test in which the serum control shows delayed or incomplete hæmolysis should be discarded or "false positives" will occur.

| | |
|---|---|
| *Tube 1.*<br>1 volume patient's serum 1/9.<br>1 ,, complement 3 M.H.D.<br>1 ,, antigen (dilution determined) | After 18 to 20 hours in the ice-chest 1 volume of sensitised cells is added to every tube. |
| *Tube 2.*<br>1 volume patient's serum 1/9.<br>1 ,, complement 4 M.H.D.<br>1 ,, antigen (dilution determined) | |
| *Tube 3.*<br>1 volume patient's serum 1/9.<br>1 ,, complement 3 M.H.D.<br>1 ,, physiological saline. | |

### *Results.*

Cases were divided into four categories: (1) Active gonorrhœa; (2) probably active gonorrhœa; (3) possible gonorrhœa; (4) non-gonorrhœal.

No. 1 included only cases in which gonococci had been recently demonstrated either in films or cultures or both. No. 2 included cases clinically gonorrhœal, but in which gonococci could not be found. No. 3 comprised those cases which might possibly be gonorrhœal but in which the balance of evidence was against such a diagnosis. No. 4 comprised cases in which gonorrhœa could almost certainly be excluded.

In the females it was not always easy to decide in which category (apart from No. 1) a case should be placed; the plan adopted was to follow the opinion of the medical officer examining the case, taking into consideration the microscopical findings. For example, where there was urethritis with a good deal of purulent discharge and a cervical erosion (but no gonococci found) the case was classified as "probable." On the other hand, where there was little or no urethritis and only a clear mucoid discharge from the cervix, and the microscope revealed only a few pus cells, the case was placed in category 3. Only those cases were classified as "non-gonorrhœal" in which all clinical and microscopical tests (including cultural) were negative, and the medical officer in charge of the cases certified them as non-venereal (as regards gonorrhœa).

TABLE A. *Men, 300 Sera.* TABLE B. *Women, 700 Sera.*

| Gonorrhœa. | Positive. | Doubtful. | Negative. | Total. | Positive. | Doubtful. | Negative. | Total. |
|---|---|---|---|---|---|---|---|---|
| Active .. .. | 44 | 22 | 6 | 72 | 91 | 31 | 16 | 138 |
| Probable .. .. | 45 | 30 | 18 | 93 | 91 | 141 | 62 | 294 |
| Possible .. .. | 2 | 34 | 33 | 69 | 7 | 44 | 163 | 214 |
| Non-gonorrhœal | 2 | 5 | 59 | 66 | 1 | 1 | 52 | 54 |
| | 93 | 91 | 116 | 300 | 190 | 217 | 292 | 700 |

The "active gonorrhœa" cases amongst the men in Table A included those at all stages of the disease, mostly early cases. Of the 6 negatives, 5 had had a discharge respectively for 4, 1, 1, 3, and 2 days. Of the 22 doubtful, 8 had had a discharge for only 4 days or less. Positive reactions were obtained in several cases where the discharge had only been present 2 days. The "probables" consisted principally of those who applied for treatment with little or no discharge, but with threads in the urine, in which gonococci could not be demonstrated. The "non-gonorrhœal" cases were mostly those who had perhaps run a risk but showed no signs, or those who wanted their blood tested for syphilis before getting married. In this category there were two positives. In one case the man was accused by a girl of having given her gonorrhœa, which he denied, though he admitted two exposures 2 and 4 weeks respectively before coming to the clinic. In the other case the man admitted risks 10 weeks and 3 months previously, on one of which occasions he had become infected with pediculi pubis!

The "doubtful" results constitute, it is true, nearly half the total and indicate, in my opinion, a further careful clinical and bacteriological investigation. Probably many represent cured cases in which the antibody has already been partially eliminated. If one neglects the doubtful results:—

| | | | Per cent. |
|---|---|---|---|
| 44 out of 50 | active gonorrhœa | were positive | = 88 |
| 45 ,, 63 | probable ,, | ,, ,, | = 71 |
| 33 ,, 35 | possible ,, | ,, negative | = 94 |
| 59 ,, 61 | non-gonorrhœal ,, | ,, ,, | = 97 |

It will be seen from Table B that here, again, "doubtfuls" number nearly half and have the same significance as in the male cases. Of the "active gonorrhœa" group several were early cases—i.e., within two weeks, whilst several subsequently gave positive results. I think there is little doubt that a positive does not appear so early in women as in men, and perhaps does not occur at all where the urethra alone is affected. The one case giving a "false positive" was a case of syphilis, with a slight white discharge (containing, however, very little pus) and giving a strongly positive reaction on the test being repeated, so that gonorrhœa could not be *absolutely* excluded. Excluding doubtful results:—

| | | | Per cent. |
|---|---|---|---|
| 91 out of 107 | active gonorrhœa | were positive | = 85 |
| 91 ,, 153 | probable ,, | ,, ,, | = 60 |
| 163 ,, 170 | possible ,, | ,, negative | = 96 |
| 52 ,, 53 | non-gonorrhœal ,, | ,, ,, | = 98 |

A point of interest in regard to the above is that in a number of cases gonococci were only demonstrated (after previous failures) some time after the complement-fixation test had been recorded as positive.

### *Conclusions.*

The above does not aim at being a complete analysis; the latter would occupy an enormous amount of time and too much space for such an article as this, but it

is hoped that, at least, the complement-fixation test has been proved to be of real value in the diagnosis of gonorrhœa.

The most striking points are :—

1. The early stage at which a positive result may be obtained.

2. The relatively high percentage of positives in undoubted cases of active gonorrhœa (average 86·5 per cent.).

3. The very low incidence of "false positives"—only 3 in 1000. In none of these cases could gonorrhœa be absolutely excluded, and the cases were only included in category 4 because the medical officers in charge of the cases marked them "non-venereal"; perhaps they had not much faith in the complement-fixation test!

4. A "doubtful" test is at least suspicious, and should be repeated. It should also stimulate a further careful examination.

The test is capable, no doubt, of being rendered much more delicate; in view of the large number of doubtful results obtained, attempts are being made to accomplish this. I have not been able to come to any definite conclusion as to how long a serum may remain positive after the patient is cured. Tests of cure are laborious and very unsatisfactory, and few patients can be induced to return for examination after they think they are free from their gonorrhœa; the "man in the street" treats gonorrhœa much more lightly than he does syphilis. It is hoped, nevertheless, to repeat many of the above tests over a lengthy period in order to arrive at some definite conclusion. It has been found (particularly in cases showing complications) that a positive reaction frequently persists for 12 months or more after apparent cure, and many of the "doubtful" results were obtained in cases which had showed no clinical signs for an even longer period; these represent many of the "doubtful" results in category 3. This appears to be contrary to the findings of most workers.

In conclusion, my thanks are due to Colonel L. W. Harrison, D.S.O., director of the venereal diseases clinic at St. Thomas's Hospital, for permission to publish these notes, and to the medical officers of the clinic for providing me with the material necessary for this investigation; also to the clerks in the male clinic, and to the ladies in the lady almoner's department, for searching for and re-filing a large number of cards on a great many occasions.

*References.*—1. Jour. R.A.M.C., February, 1914. 2. Proc. Roy. Soc. Med., December, 1912. 3. THE LANCET, 1919, i., 787, and ii., 964. 4. THE LANCET, 1920, ii., 123. 5. Med. Res. Com., Spec. Rep. Series, No. 19.

## BASAL FIBROSIS IN CHILDREN.

BY G. T. HEBERT, M.D. OXF., M.R.C.P. LOND.,
PHYSICIAN IN CHARGE OF TUBERCULOSIS DEPARTMENT, ST. THOMAS'S HOSPITAL, LONDON.

IN September, 1920, in an article entitled Basal Pneumonic Residues in Children,[1] Dr. Walker Overend showed that these residues appear in his radiograms as opaque areas, often with a sharp edge and sometimes with accompanying dilatation of bronchi. The term "basal pneumonic residues" presumably includes that not uncommon affection of children which, in the absence of a satisfactory name, is called fibroid disease, non-tuberculous pulmonary fibrosis, chronic interstitial pneumonia, or sometimes bronchiolectasis, and which, on account of the well-marked signs discoverable on examination of the chest, is often mistaken for tuberculosis. It is an undoubted fact that some cases of this group show on radiological examination an increased translucency, instead of an opacity, in the affected area.

[1] Tubercle vol. i., p. 547.

This phenomenon was undoubtedly present in six of the cases of basal fibrosis, probably non-tuberculous in origin, seen in the tuberculosis department of St. Thomas's Hospital during the last year. All gave a similar history and presented similar physical signs.

The following is a typical case :—

H. A., aged 11, was sent to hospital in November, 1918, by a practitioner who had found abnormal signs in his chest. Measles at the age of 3 months had been followed by broncho-pneumonia, and every subsequent winter he had had a cough, sometimes with a little expectoration. He was said to be short of breath, but had a good appetite and appeared to be bright and well. Diminished expansion was noticed on the right side of his chest especially at the lower part, where there were also impairment of percussion note, deficient air entry, and numerous coarse crepitations. The left lung was apparently normal. For a year he remained under observation, keeping well, and attending school, but was then sent to a sanatorium from which he has just returned after a stay of over two years. All sputum examinations have been negative for tubercle bacilli; he has been apyrexial, has gained weight steadily, and has been comparatively free from symptoms. His signs are now the same as they were three years ago, with the addition of slight hollowing of the chest wall on the right side and displacement of the heart to the right.

A radiogram shows (*a*) displacement of the heart half an inch to the right; (*b*) increased translucency of the lower half of the right pulmonary field; (*c*) absence of the smaller shadows of the bronchial tree and replacement of the larger by a fine linear marking; and (*d*) shadows suggesting some increase of fibrous tissue round the bronchi at the root of the lung with slight dilatation of the bronchioles at this edge of the translucent area.

*Remarks.*

These unusual appearances in the radiogram were not due to faulty technique, for the tube had been centred correctly so as to give an even illumination of the chest; nor was absence of bronchial shadows due to voluntary or involuntary movement during exposure, for all of the shadows present were sharply defined. Though the converse was not always true, all of the cases showing the translucent area showed displacement of the heart to that side, and presumably were definite cases of fibrosis. But fibrous tissue is generally opaque. A densely fibrotic tuberculous lung, for instance, shows a general opacity with comparatively little detail; and a less severe fibrosis, as seen in a series of radiograms from a mild case of tuberculosis, may show the replacement of a hazy area, representing active disease—but due, perhaps, largely to congestion—by linear shadows which become quite definite after six months.

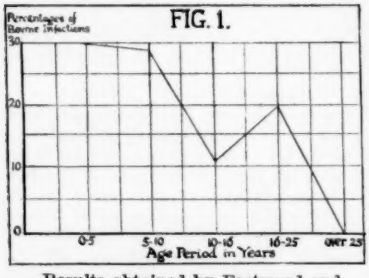
The fact that in the cases of non-tuberculous fibrosis under consideration the fibrous tissue does not cast the usual shadow is difficult to explain. It is improbable that the fibrous tissue is in an unformed, perhaps a gelatinous, state, for the length of history in these cases may be ten years or more. It is more probable that the normal shadows of fibrous tissue are not seen because the surrounding lung parenchyma is avascular, emphysematous, œdematous, or in some other state which renders it unusually translucent. Of the possibilities mentioned, œdema is the most probable from the pathological standpoint. It may be objected that an œdematous area of lung tissue should be opaque to X rays rather than translucent. Free fluid in the chest is, of course, opaque, but it does not follow that fluid in the tissue of the lung, with slight exudation into the air-containing structures, produces the same appearance. From the clinical standpoint the explanation of the crepitations is not clear. It is very unlikely that in the majority of cases they are caused by secretion. Some of the finer sounds may be produced in collapsed areas, but the remainder, being medium-sized and typically moist, suggest the presence of fluid in structures larger than the alveoli. It is possible, therefore, that in some cases of basal fibrosis the interstitial tissue becomes œdematous and then shows the X ray appearance noted above. But whatever its explanation, this translucency is, it is claimed, an important piece of evidence in the differentiation of non-tuberculous from tuberculous fibrosis of the lungs, for in the latter it does not appear to occur.

# THE SYSTEMATIC USE OF POISSON'S FORMULA.

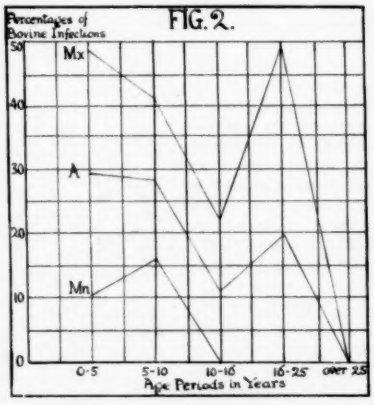
BY G. DE M. RUDOLF, M.R.C.S. ENG., D.P.H.,
SECOND CASUALTY OFFICER, KING'S COLLEGE HOSPITAL.

THE value of statistics depends to a great extent upon the use that can be made of the figures by succeeding investigators. If the latter, proceeding along the same lines as the original inquirer, are able correctly to compare their own figures with those of the first author, the statistics are of great value, but if the two sets of figures are not strictly comparable the statistics are of less value. In a great number of statistics the figures are not reduced to a reliable common basis. The two following instances illustrate this point.

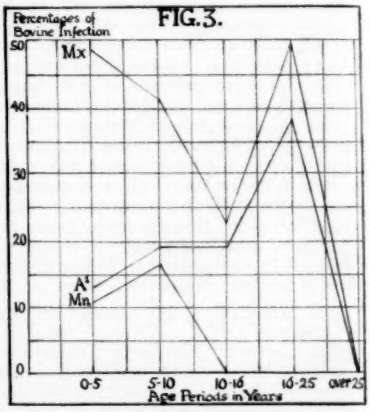
The late Sir William Osler[1] found that, in 100 autopsies of cases of lobar pneumonia, both lungs were affected in 17 patients—that is, 17 per cent. Again, Dr. Aldren Turner[2] records that in 200 autopsies on intracranial tumours, 96, or 48 per cent., of the growths were found to be gliomata. Now, other investigators proceeding along the same lines as either Sir William Osler or Dr. Aldren Turner would expect to obtain approximately the same results in the respective observations as did these two inquirers. The investigator inquiring into the percentage occurrence of gliomata is, however, more likely to obtain results closely approaching those observed by Dr. Aldren Turner than another investigator inquiring into the condition of the lungs in pneumonia likely to approach the results of Sir William Osler; Osler's 17 per cent. was based upon a study of 100 cases, whereas Aldren Turner's 48 per cent. was based upon a study of 200 cases. Consequently, although these results have been expressed in a similar way—i.e., as the number of certain cases found in 100 autopsies of the particular disease—Aldren Turner's results are of more value than those of Sir William Osler. It follows, therefore, that the expression of a series of results as a percentage is of little value unless the total number of cases observed is also stated.




Results obtained by Eastwood and Griffith.




A represents graph of original observations. Mx the maximum percentage that could be found by other investigators. Mn the minimum percentage.




A¹ represents results apparently differing from those drawn in Fig. 1, but actually confirming them.

### *Method of Estimating Maximum Possible Variation.*

There is, however, a well-known method which, when applied to a series of observations, shows the maximum variation possible which could be found in any other series of similar observations. This method depends upon Poisson's rule.[3] If, in a series of observations, of which one part shows one possibility and the other part a second possibility, and the total number of observations in the two parts is equal to the total number of observations in the whole series, the following formula be applied, the maximum possible variation of any subsequent series can be determined, provided that the second series was as great as or greater than the first series.

If M = total number of observations recorded;
m = number of observations in one group;
n = number of observations in the other group;
and m+n = M,

then Poisson's rule states that the maximum variation possible $= {}_2.\sqrt{\frac{2mn}{M^3}}$, and the variation per cent. $= 100\left({}_2.\sqrt{\frac{2mn}{M^3}}\right)$

An example will show how the formula can be applied. Dr. G. F. Still[4] states that in 383 cases of chorea, 183, or 47·48 per cent., had concurrent or previous articular rheumatism. In this instance therefore M = 383; m = 183 (or 200); n = 200 (or 183);

$$\therefore \quad {}_2.\sqrt{\frac{2mn}{M^3}} = {}_2.\sqrt{\frac{2\times183\times200}{383^3}} = 0{\cdot}07218$$

$$= 7{\cdot}218 \text{ per cent.}$$

Consequently, another observer recording cases of chorea with articular rheumatism might expect to find that his results differed from those of Dr. Still by 7·218 per cent.; thus his results would lie anywhere between 47·78 per cent. +7·218 per cent. and 47·78 per cent. −7·218 per cent.; that is, between 54·998 per cent. and 40·562 per cent. Of course, the second observer would only expect to find his results falling between these limits if the number of cases in his series was as great as that in Dr. Still's series. If this were the case, and his results lay between 54·998 per cent. and 40·562 per cent., then his work would be in accordance with that of Dr. Still, although his figures might vary from those obtained by Dr. Still by 7·218 per cent.

The maximum variation possible does not depend entirely upon the total number of observations made, for in the series of observations quoted above, Dr. Still found that two cases—that is, 0·5222 per cent.—had rheumatic nodules without cardiac bruits or joint symptoms. If the formula be applied in this case it will be found that the maximum variation possible is 1·041 per cent. Therefore in another series of cases of chorea the number of patients found with rheumatic nodules, but without cardiac bruits or joint symptoms, would lie between 1·563 per cent. and 0·519 per cent.

### *A Method of Plotting Graphs in Conjunction with Poisson's Rule.*

The object of this article can now be explained. It is the description of a method, which I believe to be new, of plotting graphs of statistics in conjunction with Poisson's rule, whereby the graph is made of greater value than if it were plotted in the usual way. An example will show the method which I suggest.

Hewlett[5] quotes the work of Eastwood and Griffith who, investigating the characteristics of the tubercle

bacilli found in human bone and joint tuberculosis, found that of 261 cases of all ages of this disease, 55 were infected with the bovine type of tubercle bacillus. The age-incidence is shown in the table.

| Age-period in years. | Total No. of cases. | No. of bovine infections. | Percentage of bovine infections. | Max. variation possible. |
|---|---|---|---|---|
| 0–5 .. .. | 47 | 14 | 29·79 | 18·87 |
| 5–10 .. .. | 108 | 31 | 28·71 | 12·31 |
| 10–16 .. .. | 62 | 7 | 11·29 | 11·37 |
| 16–25 .. .. | 15 | 3 | 20·0 | 29·2 |
| Over 25 .. | 29 | — | 0·0 | 0·0 |
| — | 261 | 55 | — | — |

This table also shows the percentage of bovine infections with maximum variations possible which I have worked out for each age-period. If the percentages of the bovine infections be plotted as a graph in the usual way, the graph shown in Fig. 1 will be obtained. This graph does not necessarily represent what other investigators, working on the same subject, might find, for it only represents the results obtained by Eastwood and Griffith; it does not show the variations from the results of Eastwood and Griffith which could be obtained by other investigators without their results being in disagreement with those of the two original workers.

To increase the value of the graph, therefore, I suggest that in cases of this type—that is, where only two possibilities are dealt with—Poisson's rule should be applied to each observation plotted, and that the limits of possible variation should be plotted above and below each observation. In this way three graphs will be obtained, as shown in Fig. 2. It will be seen from Fig. 2 that any succeeding investigator might obtain results whose graph could lie anywhere between graphs Mx and Mn while still being in accordance with the results obtained by Eastwood and Griffith. For instance, a graph such as that seen in Fig. 3 might be obtained. When this is compared with Fig. 2 it will be seen that the two graphs of the observations are quite different, that of Fig. 2 showing its maximum at the 0–5 years age-period, while that of Fig. 3 ($A^1$) has its maximum at the 16–25 years age-period. It is clear that if such a graph as that seen in Fig. 3 had been obtained by later investigators working upon the same subject as Eastwood and Griffith, the work of these two investigators would be doubted, as apparently it would not be confirmed by succeeding inquirers. Actually, however, the work would be confirmed, for the results obtained by later investigators would lie between the maximum possible limits resulting from the work of the first observers.

*Comparative Value of Graph and "Bar."*

As the smaller the maximum variation possible the smaller the "bar"—as I propose to term the values included between Mx and Mn—it follows that the narrower the bar the more nearly does a graph approximate to the graph which would be obtained if an infinite number of observations for each plotting could be taken. Consequently, the graph of a series of observations is not of so great a value as is the bar based upon the same observations, for the bar not only points out the value of the observations, but also the limits within which succeeding investigators might obtain results in accordance with the original findings. The ordinary line graph, on the other hand, is only a record of the observations made on a comparatively few particular cases.

I believe that it is largely on account of Poisson's rule not being applied and of plotting graphs of statistics in the usual way that discordant results have so often been recorded by different observers investigating the same conditions. This apparent lack of confirmation which is obtained by recording observations only, and not maximum variations possible also, is unfair not only to the original worker, but also to the later investigator, for the apparent lack of confirmation throws doubt upon the work of both, whereas their results may actually be in complete accordance.

I would therefore urge that Poisson's rule be applied to all statistical work in which there are only two possibilities, and that in the case of graphs of statistics, the graphs which I have termed Mx and Mn should be plotted. I urge this both for the protection of the work of the original investigators and of later inquirers. At a later date I hope to draw up a table of maximum variations possible for different numbers of cases, so that one can find by referring to the table the maximum variation possible in any series of observations whose total number and proportionate parts are known.

*References.*—1. Osler, Sir W.: Principles and Practice of Medicine, 1919, 80. 2. Turner, W. Aldren, and Stewart, T. Grainger: A Text-book of Nervous Diseases, 1910, 227. 3. Parkes, L. C., and Kenwood, H. R.: Hygiene and Public Health, 1917, 675. 4. Still, G. F.: Common Disorders and Diseases of Children, 1920, 470. 5. Hewlett, R. Tanner: A Manual of Bacteriology, 1918, 363.

A CASE OF

## INFANTILE ACUTE ENDOCARDITIS.

BY E. F. SKINNER, M.A., M.B. CAMB., F.R.C.P.LOND.,
ASSISTANT PHYSICIAN, SHEFFIELD ROYAL HOSPITAL.

THE occurrence of acute endocarditis in infancy is sufficiently rare to justify the record of a case.

An interesting, though perhaps theoretical, point is the question as to whether the condition was a simple or a malignant endocarditis. G. F. Still, in his "Common Disorders and Diseases of Childhood," states that "the possibility of acquired simple endocarditis in a child under 2 years of age can be almost entirely excluded" on account of the fact that simple endocarditis almost invariably follows articular rheumatism, which hardly ever occurs under 3 years of age and almost never under 2; out of over 1000 cases of acute rheumatism or chorea in children he has only seen eight cases under 3 and not a single case under 2 years of age. Certainly the improbability of this case being one of simple acute endocarditis, either of fœtal or post-natal acquirement, is borne out by the total absence of anything like symptoms of rheumatism in mother or child. It seems more likely that the endocarditis was of the infective type, since the child had a large area of unhealthy skin in which organisms of all kinds might be present, and it is not unlikely that some pathogenic variety gained entrance to the tissues at some place where the epithelium was damaged or absent. Against this view is the apyrexial course, but as this was only observed for some 20 hours it may not necessarily exclude a type of fever with a rather prolonged apyrexial period, during which the child might have been under observation. It must, however, also be remembered that the baby looked quite well apart from its eczema.

The incidence of malignant endocarditis in infants seems greater than that of simple endocarditis, though actual figures are difficult to ascertain. Malignant endocarditis, says Still, "does occasionally occur in infancy but it is excessively rare, and when it does occur is associated with an obvious source of infection." He states that he has seen two cases, one in a child of 7 months and another at 2 years, both associated with empyema. In this case there was in the eczema a possible source of infection, though there was no clinical pustulation; but there was also the possibility of a previous infection from the circumcision wound. The appearance of the vegetations, though neither ulceration nor any extension on to the mural endocardium was present, was suggestive of the infective type of the disease, but it would, I think, be impossible from the scanty evidence available to pronounce definitely on the ætiology, and though the weight of evidence points to a probable malignant type, it is only safe to say that the condition was an acute endocarditis; the occurrence of this condition

in an infant of 4 months is my excuse for presenting such an incomplete case.

*History.*—On Jan. 24th, 1922, a young mother brought her first baby to see me on account of a severe attack of infantile eczema which had shown no improvement under various lines of treatment. The baby was 4 months old, and had been suffering from an eczematous eruption from the age of 7 weeks; apart from the rash he was a healthy-looking infant, well nourished, and not at all fractious. The eczema chiefly affected the scalp, face, and flexor surfaces of limbs, with a few scattered nummular lesions on the buttocks, the eruption being moist and crusted but not pustular. Birth had occurred at full term and was normal; the baby was suckled for a week, after which Allenburys No. 1 food was employed for two months, followed by modified cow's milk, the reason for the discontinuance of the breast feeding being the too common one of "all the milk leaving the breasts." The mother gave the following account of her baby's previous history: When three weeks old circumcision was performed, and five hours after the operation smart bleeding took place and the doctor in attendance found it necessary to suture the prepuce (I could not ascertain whether this had been done previously), after which healing occurred naturally, though the baby seemed "out of sorts" for several days; it was noticed that its hands and feet were always blue, but did not feel cold to the touch. At seven weeks eczema appeared on the cheeks and very quickly spread to the scalp and limbs.

*Examination.*—I examined the child on the afternoon of Jan. 24th and beyond the eczema could detect nothing unusual; the motions appeared normal, and the frequency of micturition was that of a healthy baby; there was no pyrexia, while the gums and buccal mucous membranes showed no sign of any infection. Apart from the skin eruption the child appeared remarkably well.

*Admission to Hospital.*—The baby was taken into hospital and put to bed about 5 P.M., receiving his first feed at 6 P.M. (modified cow's milk taken well with no regurgitation), after which he went to sleep, waking at 2 A.M. He was again fed, and went to sleep immediately, waking once more at 6 A.M., when he was given a third feed. Again he went to sleep, and at 8 A.M., when the day-nurse went to dress the eczema, she found the child sleeping and decided to leave him for half an hour, intending to carry out the dressing later; but on returning at 8.30 A.M. she was astonished to find the baby quite dead. He had made no cry, and had not even turned over; there was no cyanosis or frothing at the mouth, nothing to suggest a cause of death, and when informed I was at a loss to account for it.

*Autopsy.*—I notified the coroner, and was present at the autopsy carried out on the following day, when it was found that all the organs were healthy with the exception of the lungs and the heart. On opening the thorax it was clear that there was no gross or widespread disease, both lungs being of the beautiful pink colour seen only in infants and quite free from any adhesions or the presence of lymph, but on the surfaces of both lungs were several bluish marks about the size of a mustard seed which on closer examination proved to be minute subpleural hæmorrhages. There was no excess of fluid in the pleural cavity or in the pericardial sac when the latter was opened. The heart appeared normal in size and colour, but on section it was observed that the tricuspid valve was somewhat less smooth than normal, and perhaps a little pinker than might have been expected, though the right auricle and pulmonary artery appeared perfectly healthy. The mitral valve, however, was found to be gravely involved, the free edges and auricular surfaces of the flaps being extensively covered with a beautiful growth of soft vegetations, not large, and quite recent, being shiny and pink in colour and extremely friable. The heart of a baby four months old is so small that it was difficult to make any detailed dissection, but so far as could be ascertained at the time the openings of the coronary arteries were patent and there were no congenital defects of any kind present. The cause of death having been ascertained with sufficient accuracy for the coroner's court, it was decided to leave the further investigation of the heart to the pathological department of the University, but by a regrettable misunderstanding the mortuary attendant failed to preserve this extremely beautiful pathological specimen.

*Remarks.*

Though the discovery of this unexpected and surprising lesion determined the terminology of the death certificate, the essential cause of death was obscure. There had been no clinical signs of any pulmonary or cerebral disturbance, nor were there present any pathological features, such as pulmonary infarcts or thrombosis of cerebral blood-vessels to account for such a sudden death. The most likely explanation perhaps is the onset of ventricular fibrillation consequent on the presence of an embolus in a coronary artery sufficiently small to have passed beyond the openings, so that no sign of its presence was ascertainable from the naked-eye appearances of these arterial channels. Acute endocarditis in infancy is of extreme rarity, apart from fœtal endocarditis, and I think this case was one of acquired disease for the following reasons. First, a careful history of the mother's previous health and pregnancy failed to elicit any suggestion of rheumatism or any other illness conceivably transmitted through the placental blood; syphilis was excluded in both parents, and so far as could be discovered no ante-natal circumstances seemed possible as ætiological factors. Secondly, as occurs in acquired disease, the left side of the heart was much more seriously involved than the right, whereas in endocarditis of fœtal origin the right side is usually more diseased. Thirdly, there were no congenital defects in the heart, a factor of some importance, as fœtal endocarditis is much more likely if such defects are present.

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### SECTION OF OTOLOGY.

A MEETING of this section of the Royal Society of Medicine was held on May 19th, Dr. LOGAN TURNER, the President, being in the chair.

*The Resonating System in the Cochlea.*

Mr. GEORGE WILKINSON read a paper on the part played by the cochlea in the perception and analysis of sound, demonstrating his views by the epidiascope and by means of an apparatus constructed on the basis of the human cochlea. Helmholtz had declared that the only mechanical means by which sound could be analysed into its component vibrations was by a series of resonators, and that still held good. Every alternative theory was based on the possibility of a central analysis of the sounds received—i.e., by the brain. A notable step in advance was Dr. Albert Gray's observation that the spiral ligament increased in bulk from the base to the apex of the cochlea, denoting that it acted as the organ of tension. This increased bulk was a definite factor whose significance had hitherto been too lightly regarded. Mr. Wilkinson contended that the basilar fibres were loaded by a mass of cochlear fluid, which moved as they moved. The displaced fluid would travel along the scala until the membrane closing the round window was bulged to a corresponding extent; and a similar quantity of fluid would be displaced in the opposite direction in the scala vestibuli. The result would be the same whether the movement originated from an impulse applied to the stapes, or from vibratory movements of the sector itself. The mass of fluid moved was invariable for each sector, did not depend on the amplitude of the movement, and could be defined as that of a double column of fluid, the base of which was equal in area to the surface of the sector, and the length to the sum of the distances of the sector from the round and oval windows. The mass of the sector itself was inconsiderable in comparison with that of the fluid constituting the load. The formula for vibrating strings was:—

$$n = \tfrac{1}{2}\,l\sqrt{\frac{t}{m}}.$$ This became $$n = \tfrac{1}{2}\,l\sqrt{\frac{t}{db}}$$

when applied to the transverse sectors of the basilar membrane, d being the sum of the distances of the sector from the round and oval windows, and b the width of the sector. The helicotræma was the essential part of the analysing membrane, and the conception of the mechanism now advanced allowed for a capacity of 10 octaves.

The model demonstrated by Mr. Wilkinson was a brass box in two chambers, representing the scala vestibuli with the ductus cochlearis, and the scala tympani. A window, closed by a rubber membrane, opened into each, and to one of the membranes was attached a small wooden plunger, the stapes. The chambers were divided by the analogue of a basilar membrane, formed of strands of fine brass wire stretched transversely and plastered over. The tension on the threads was regulated by suspending from them a graduated series of weights, and the whole was filled with water. It was set in action by tuning-forks applied to the stapes. The compass of the strings was four octaves. A fine powder enabled the vibrations of the particular segment to be clearly seen.

Dr. ALBERT GRAY said that this piece of work was the most important contribution to their specialty that had been made for many years. He briefly sketched the steps which had been made in the knowledge on the subject, and said Mr. Wilkinson's was the first demonstration of the membrane vibrating in sympathy with harmonic vibrations. This third factor, the mass, was very important. When he (the speaker) wrote on the subject in 1900, the "telephone" theory held the field—i.e., that the nerve impulses were analysed in the brain; but opinion had now reverted to that of sympathetic resonance as the method of analysis. Some assumed the existence of pressure patterns in the basilar membrane, but no one had shown how they could be produced except by sympathetic resonance. He would be surprised if sounds could be shown to be analysed in any other way than by sympathetic resonance in the cochlea.

Sir JAMES DUNDAS-GRANT said that this demonstration was skilful and scientific. It now seemed quite clear that sounds were analysed in the cochlea, but they had to be compounded in the brain to enable us to appreciate the combined sensation.

Mr. WILKINSON, in the course of his reply, said he believed the analysis of sound was, in its ultimate stage, a measurement of very short intervals of time, a function which, in its essence, was mechanical. The inertia of the fluids would destroy anything like the pressure patterns which had been referred to. He disagreed with the view expressed as to brain analysis.

*Exhibition of Cases and Specimens.*

Sir JAMES DUNDAS-GRANT communicated some results of vestibular tests in a fatal case of cerebello-pontine tumour. He said the patient from whom the specimen exhibited was removed showed a very fine nystagmus to the right, and a very coarse nystagmus to the left. The caloric test, with cold air, in the right horizontal canal gave nystagmus after 30 seconds, but the right vertical one gave no nystagmus after 90 seconds. The patient had evidence of optic neuritis and paralysis of the left sixth nerve. The skiagram exhibited showed enlargement of the internal auditory meatus.

Dr. J. S. COLLIER and Mr. LIONEL COLLEDGE showed a case of malignant disease of temporal bone, involving cranial nerves in a man, aged 40, who complained in February last of headache and pain in the frontal region and of right facial paralysis. He was deaf on the right side, and the deep part of the meatus was filled by a red mass. There was no optic neuritis or inequality of pupils. The mastoid when opened was found to be full of growth; the facial nerve was exposed in the aqueduct for about a quarter of an inch, and there was a fistula into the external semicircular canal. The canals were removed as they were full of growth. The ossicles were also surrounded with growth, but no pus was encountered. Further exploration showed growth extending between the inner and the outer tables of the skull in every direction, so the operation was abandoned. The relief from pain and headache only lasted three weeks; then a boss the size of half-a-crown appeared on the right frontal bone, and another just above the right ear; and there was evidence of involvement of the right cranial nerves from the seventh to the twelfth.

Mr. COLLEDGE sent for examination a girl, aged 16, who a year ago was operated upon for mastoid disease and meningitis secondary to suppuration of the right labyrinth. The cochlea was found to be full of pus. On three occasions the *Staphylococcus aureus* was cultivated from the cerebro-spinal fluid. The facial nerve was not seen, but a complete facial palsy resulted. As there was no improvement in six months, and reaction of degeneration was present, the hypoglossal nerve was divided, and the central end anastomosed to the peripheral end of the facial. The peripheral end of the hypoglossal was anastomosed to a slip from the spinal accessory. Some wasting of the right half of the tongue followed, but this was very slight, and all symptons had now disappeared, except dissociated voluntary control of that side of the face.—Dr. DAN MCKENZIE, commenting on the dissociated movement, said he did not think operation had ever yet succeeded in obtaining for the patient emotional movement of the face—i.e., that responding to direct volition. The most striking change seen after the anastomosing operation was in the better tonus of the face and the removal of the blank lack of expression. There was not yet good reason for expecting a much better result from doing this operation than if the patient had been left alone.

## TUBERCULOSIS SOCIETY OF GREAT BRITAIN.

A MEETING of this Society was held at the Margaret-street Hospital for Consumption on May 22nd, Dr. DE CARL WOODCOCK, Vice-President, being in the chair. A discussion was opened by Dr. H. WILSON, tuberculosis officer for Southwark, on

*Therapeutic Measures for the Relief of Pulmonary Tuberculosis,*

especially in relation to dispensary treatment. Dr. Wilson considered that as tuberculosis officers had given more time to the subject and had a more accurate knowledge of the pathology and conditions of the disease than the general practitioner, they would in most cases be able to give greater relief. In his opinion, it was a gross error—and a very prevalent one—to give cough mixtures to tuberculosis cases. He believed them to be detrimental to the digestive system. He then described the methods by which he had obtained the best results. He had found picrate of ammonia to be the best general tonic; he emphasised the value of calcium salts in general treatment, and recommended bismuth in large doses for diarrhœa.

Dr. F. E. GUNTER exhibited a series of charts showing the results of tuberculin treatment in a number of cases. Theoretically, he said, tuberculin was the right remedy and recent practice was to push its administration, but much remained to be known as to the correct groups of cases to which it could be satisfactorily applied. One group in which it had proved valuable was the asthmatic.

The meeting was then opened for discussion and there was criticism of the action of the Ministry of Health in attempting to restrict tuberculosis officers to making diagnoses only, and to instructing the general practitioner how to conduct the treatment. The consensus of the meeting was that the position adopted by the Ministry was detrimental to the best interests of the public; for it was absurd to create specialists and then deny them the right to use their special knowledge.

Dr. Alexander Blackhall-Morison has been elected a corresponding member of the Medico-Chirurgical Society in Edinburgh.

Sir George Makins has been appointed a director of the Clerical, Medical, and General Life Assurance Society to fill the vacancy caused by the death of Sir Alfred Pearce Gould.

# Reviews and Notices of Books.

EPIDEMIOLOGY AND PUBLIC HEALTH.

A Text and Reference Book for Physicians, Medical Students, and Health Workers. In three volumes. By VICTOR C. VAUGHAN, M.D., LL.D., Emeritus Professor of Hygiene, University of Michigan. Assisted by HENRY F. VAUGHAN, M.S., D.Ph., and GEORGE T. PALMER, M.S., D.Ph. Vol. I.: Respiratory Infections. Pp. 688. London: Henry Kimpton. 45*s*. per volume; sold in sets only.

A popular writer[1] on man and his environment has described man as the arch-enemy of man. "To himself and his fellows his exhalations are injurious. His waste products form a never-failing source of pollution, scattering broadcast the seeds of disease and the seeds of death." And he goes on to say that a hundred forms of sickness to which our ancestors were immune are described to-day in any treatise on pathology, and of these new pests the bulk are due to the more malignant because the more concentrated contagion of man. Prof. Vaughan's book affords a partial corroboration and an effective challenge to this half-true and provocative statement. He is no epidemiologist in the narrow sense, and he not only goes deeply into the history of epidemic disease, including in his story the recent chapter of 1914–1918, but he dwells largely on symptoms and pathology. It has been only by closely inter-relating observations of both kinds that the true nature of infection is now coming to light. This is really the central theme of a great book. Whereas a few years ago diphtheria was only feared from direct contact with one actually sick from this disease, we now know how it is distributed throughout communities and from one community to another by peopie apparently in perfect health. The typhoid patient confined to bed under intelligent care is of little danger in regard to the spread of disease, whereas the typhoid carrier travels up and down the country and scatters the seeds of infection broadcast.

Prof. Vaughan's own early experience in preventive medicine included the regular ration of Peruvian bark and whisky served out for the daily paroxysm of malaria in Southern Illinois, before Baccelli adopted quinine as a prophylactic measure. His boyhood was spent on a Missouri farm where whites and blacks, old and young, deposited their excreta in corners behind barns, in reeds and shrubs, whence they were scattered by the bare feet of children and domestic animals until their bacterial contents were widely and abundantly distributed. In pre-antitoxin days he saw the physician of a Michigan community allow school children to file in and kiss in succession the corpse of a school child, dead of diphtheria, and report the disease as non-contagious. He was present when Roux reported on diphtheria antitoxin to the International Congress of Hygiene at Budapest in 1894. He witnessed the effects of tropical malaria on American soldiers in Cuba in the 1898 campaign, and what he then saw made him acquiesce in the suggestion that malaria played an important part in the decline of Greek and Roman civilisation. Later on he went through an epidemic of yellow fever, witnessed at the invitation of Dr. Haven Emerson the 1916 epidemic of poliomyelitis in New York, and in 1917–18 was placed by General Gorgas in charge of infectious camps in the U.S.A.

Released from Army service in 1919, Prof. Vaughan has spent three years in preparing the book of reference of which the first volume only is before us. Couched in simple non-technical language, illustrated with charts and diagrams which can be understood by the unskilful reader, the book nevertheless contains the essence of experience, ancient and modern, on all diseases known to be communicable from man to man through the respiratory system. In dealing with respiratory infections, Prof. Vaughan has the advantage of a reconciling principle, common to all the various bacterial agents, of which he is himself the chief expositor. Chapter II. deals with infectious diseases as due to the introduction of foreign protein into the body. The fact of protein fever induced by albumoses and peptones introduced parenterally was first set out by Krehl and Matthes, but it was extended by Vaughan and his coadjutors into a demonstration that any desired form of fever—acute, fatal, continued, intermittent, or remittent—can be induced by regulating the size and frequency of the doses of foreign protein so administered. This work led on to the immunisation of animals with the non-poisonous part of the colon protein, and from this to a study of anaphylaxis which—and Vaughan regrets the fact—has largely been studied only in its extreme manifestation. In his opinion there is sufficient evidence to show that the reactions between invading bacterial cells and body cells are protein reactions, and this view forms a connecting link through the whole volume.

In the present volume the author has had the collaboration of Dr. Henry F. Vaughan and Dr. George T. Palmer, the one commissioner of health and the other epidemiologist for the city of Detroit. It is described on the title-page as a text and reference book for physicians, medical students, and health workers. If the remaining two volumes maintain the same high standard, the description is entirely justified.

[1] The Town Child. By Reginald A. Bray, L.C.C. T. Fisher Unwin. 1911.

---

BLOOD TRANSFUSION.

By GEOFFREY KEYNES, M.A., M.D., F.R.C.S. Eng., Second Assistant, Surgical Professorial Unit, St. Bartholomew's Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1922. Pp. 166. 8*s*. 6*d*.

THE idea of transfusing blood is a very old one, though the practice of blood transfusion has only become common in the life-time of schoolboys still young. The historical chapter with which the book opens tells of early speculations and attempts to realise them by the actual performance of blood transfusions. Transfusions into animals were carried out in 1666 in this country, and the first transfusion into man in the following year; Samuel Pepys refers to these experiments in his entries for Nov. 14th, 16th, and 28th, 1666, and Nov. 21st and 30th (not 29th as stated by Mr. Keynes), 1667. A happy ignorance took no heed of the dangers attending the operation of transferring the blood of the lower animals into man. By the eighteenth century, on the contrary, these dangers had been discovered, and were so feared that the practice fell into bad repute. In the nineteenth century dangers were recognised, and fatalities were explained away in the light of the partial knowledge of their causation. The discovery of blood groups in man early in the twentieth century was followed by a phase of over-confidence, from which there is at the present time some reaction, the problem being more complex than was at first thought. This is because our knowledge is still incomplete; as Mr. Keynes says, terms such as agglutinin, and iso-agglutinin "are used to conceal ignorance rather than as an expression of knowledge, but until more light has been shed upon the nature of the reactions, ignorance must be abbreviated."

Among the indications for blood transfusion, dealt with in the second and third chapters, hæmorrhage and shock naturally take first place, owing no doubt to war experience; but in such conditions as hæmophilia, carbon monoxide poisoning, various toxæmias, and pernicious anæmia, transfusion seems to be of considerable value. The dangers of blood transfusion are fully discussed in the light of the latest discoveries, and Mr. Keynes gives a clear account of all that is at present known with regard to the physiology and pathology of blood groups, and the choice of donors. The progress of knowledge respecting blood groups is

most encouraging, and the portion of chapter V. devoted to the Mendelian transmission of these groups shows that we do really possess a good deal of knowledge of an empirical kind. Blood transfusion undertaken after the proper preliminary tests may be described as a safe and valuable surgical procedure; in any suitable case much good may result from it, and the dangers of positive harm can confidently be stated to be nil. The book closes with a chapter on the technique of transfusion. No doubt actual procedure will be much improved in the future, for, in some form or other, blood transfusion has become an accepted therapeutic measure.

Mr. Keynes is to be congratulated on the production of a volume that is really needed; besides providing an example of the application of scientific methods to practical surgery, he has also furnished us with an extremely interesting book. The bibliography of over 300 references, which will, no doubt, be kept up to date in future editions of the book, is valuable.

---

PRACTICAL PSYCHO-ANALYSIS.

By H. SOMERVILLE, B.Sc., F.C.S., L.R.C.P., M.R.C.S., S.M.O., Whinney House Hospital. London: Baillière, Tindall and Cox. Pp. x.+142. 6*s*.

THIS work contains useful material, but the title and aim are too ambitious. The writer's experience is derived almost exclusively from war neuroses, and the difficulties met with in the neuroses of peace are not sufficiently realised. The subjects of resistance and transference, which influence the whole course of analysis, and free association, which is the key to analysis, are handled superficially, and one feels that the author, who has been successful in treating his war patients, is too sanguine in writing (p. 127) that "anyone who has read this little work carefully should now be in a position to commence an analysis." The war neuroses form a subject which is not yet closed as regards either theory or practice. As to theory there is no unanimity, and many workers who use the conception of the unconscious do not accept the sexual theory of the war neuroses as easily as the author, who indeed, in this respect, goes beyond the modest claims of Freud himself as set out in "Psycho-analysis and the War Neuroses." In practice the subject is still important on account of the large number of men who find it impossible to adjust themselves to social or economic requirements. There is a series of writers on this subject who take an individual stand at methods of encouragement, persuasion, suggestion, hypnosis, abreaction, or mental exploration; Dr. Somerville takes his place at the end of the series and, ignoring even the commonly used method of abreaction of war experience, goes straight to psycho-analysis and, if we accept his findings, makes good his position. Hence the book has its place in the literature of the subject; but as a guide to psycho-analysis it is inadequate.

---

PSYCHIATRIE DU MÉDECIN PRATICIEN.

Par les DRS. DIDE ET GUIRAUD, Médecins de l'Asile d'Aliénés de Braqueville. Paris: Masson et Cie. 1922. Pp. 415. Fr.20.

THIS is a text-book of psychiatry for the general practitioner. The descriptions, both pathological and clinical, are clear, and the subject of differential diagnosis is particularly well treated; the systematic arrangement differs but slightly from that of English works of similar nature though there is perhaps overmuch tendency to pigeon-holing. Classification involves little new, except that querulent paranoia (psychose de revendication) is separated from the main group of paranoia (délire systematisé progressif), and the possibility of amelioration of the one is contrasted with the incurability of the other. Among the "constitutions pathologiques" hysteria is still a result of suggestibility; Janet's psychasthenia remains at the stage of clinical description, and obsessions receive neither psychological explanation nor treatment. The French pay little attention to Freud, and the authors' close acquaintance with the work of other continental psychiatrists contrasts with the mis-statement (p. 83) that the partisans of Freud's theory include the phobias in neurasthenia. Otherwise it is a useful and complete text-book, well printed, and illustrated with eight plates, and, like many continental products, published in a cheap form.

---

MICROSCOPY.

*The Microscope*. By CONRAD BECK. London: R. and J. Beck, Ltd. Pp. 144. 2*s*. 6*d*.

THIS book, published by a manufacturing house, and under the name of a leading member of the firm, purports to be exactly what it is—a handbook to the wares which the house produces. It need hardly be said that this is no disparagement. Such a handbook is very useful, and Mr. Beck has collected and put before his readers a large amount of valuable information in a clear and readable style. Many pathologists will be much obliged to him for his work. German manufacturers have made us acquainted with a large body of technical literature, especially in relation to the microscope, which, produced really in the interest of the trade, is presented as disinterested science. That sort of book is not gratefully accepted by our readers.

---

*Précis de Microscopie*. Third edition. By Dr. M. LANGERON, Chef de Laboratoire of the Faculty of Medicine, Paris. Paris: Masson et Cie. 1921. Pp. 916. Fr.30.

IN its present edition this book has been largely revised and improved, especially in those sections which are of most interest to medical practitioners. On all that relates to the preparation of specimens the work, of which three-fourths are devoted to this purpose, constitutes an excellent repertory of both theoretical and practical information. Dr. Langeron quotes all the latest authorities, and has enriched his subject with original comments of the greatest value. To this section of his book we can give unqualified praise. The first part of the book, however, is devoted to the description of the microscope and its accessories, and the discussion of the optical theory controlling its manufacture, and presents no outstanding merit. The obsolete Abbé theory of the microscopic image is delivered at great length and without any suggestion that it has ceased to hold the field. In fact the author seems to be unaware of the extent to which it has been damaged by modern criticism, and of the fact that Abbé himself eventually disclaimed his crude original theory. This is of less consequence, however, than the unsatisfactory advice given on the control of the illumination of the object on the stage. For example, on p. 35, the author says: "On peut admettre, comme règle générale, que l'éclairage le plus favorable est fourni par un cône lumineux, dont l'ouverture est égale au tiers de celle de l'objectif et qui par conséquent, n'éclaire que le tiers de l'ouverture de cet objectif." The reference here is, apparently, to the rule of thumb adopted by many microscopists for illuminating diatoms and similar objects (which strongly reflect the top light falling upon them from a powerfully illuminated objective), with the object of reducing the catoptric glare produced—that is to say, the leaving of a peripheral region of the objective unilluminated. The rule laid down is that the unilluminated opening should be approximately equal to one-third of the image forming cone, the condenser beam illuminating two-thirds of the opening of the objective. To reverse this proportion and prescribe a solid cone of one-third of the aperture of the objective is such an error as ought not to be made in a first-class work on the microscope. In any case, it has no significance in relation to stained objects and other specimens which, being mounted in media of the same refractive index as themselves, do not reflect the catoptric glare up the tube of the microscope, and therefore does not very directly bear on histological specimens. On his own ground Dr. Lengeron is most useful, but in discussing the theory of the microscope he is not seen at his best.

REPORT OF THE ST. ANDREWS INSTITUTE FOR CLINICAL RESEARCH, ST. ANDREWS, FIFE.

Vol. I. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1922. Pp. 208. 10*s.* 6*d.*

THE St. Andrews Institute for Clinical Research was founded by Sir James Mackenzie, now its honorary director, with a view to the prevention of those diseases that are common among the people of this country. To achieve that object it is obviously necessary to know the life-history of such diseases from onset to termination, and, as the general practitioner is the only type of individual with opportunity for such continuous observation, the Institute has enlisted the coöperation of all the practitioners in the town of St. Andrews. To aid and support them the Chandos professor of physiology and the Bute professor of anatomy in the University of St. Andrews are attached to the medical staff, while the Institute has further at its disposal a consulting surgeon and a consulting ophthalmologist, as well as a laboratory provided with expert chemist, bacteriologist, and radiologist. The volume before us is part of the outcome of the first year of work at the Institute. The first article contains an address on clinical research by the honorary director, in which he justifies the enterprise to good purpose, while giving a warning against immediate expectation of results. Sir James Mackenzie deals in another article with the theory of disturbed reflexes in the production of symptoms of disease, and also contributes an article on prognosis. The remaining eight articles, some of which have appeared in substance in our own columns, are the result of patient and comprehensive investigations by various members of the staff, beginning with Dr. Andrew Rowand's article on the Present State of Medical Knowledge regarding the Diseases Common among the People, and ending with Prof. David Waterston's Observations upon Cutaneous Sensation.

Although the objects of the Institute are now widely known, the methods adopted there are not easy of apprehension to superficial study, and all those whose previous education and bent have been centred rather upon evidences of advanced disease will do well to peruse with care this first volume of the St. Andrews results. The work may be regarded as a new chapter in contemporary medicine, the sequel to which should throw light upon problems that daily confront the doctor in his work.

---

THE MECHANICS OF THE DIGESTIVE TRACT.

By WALTER C. ALVAREZ, M.D., Assistant Professor of Research Medicine, George Williams Hooper Foundation for Medical Research, University of California Medical School. New York: Paul B. Hoeber. 1922. Pp. 192. $3.50.

THIS fascinating and stimulating book will be welcome, and should have a considerable vogue in this country. The author is evidently widely read in his subject, is an able critic and a scholarly writer, and has made his book a real digest of much recent information. The volume reflects great credit on the application of physiological principles and methods of investigation to practical problems of medicine. With many of the conclusions we disagree, while at once admitting that the author has made out his case cleverly, indeed so cleverly that there is a danger of his leading the inexpert to follow him where they should not. The book is based on Dr. Alvarez's own work on the metabolic gradients in the alimentary tract; his thesis is that the passage of peristaltic waves in a certain direction is due to the fact that there is a metabolic gradient in that particular direction, the wave passing from a point of high metabolic rate, high contraction frequency, high sensitivity to drugs, to a point where all these manifestations are lower. Reversal of peristalsis implies reversal of the gradient. There is a certain amount of experimental evidence for this theory, but it appears to us that to a very great extent it is merely a re-statement of what actually happens. The "gradients" of the stomach present a complicated picture, and we think Dr. Alvarez's conception will prove to be too simple. He appears to underrate the nervous control, and then complicates the position in a re-statement of what actually occurs by saying that the influence of the nerves is exerted on the gradient. But, right or wrong, his theories cannot help but prove stimulating, and we much prefer such a book to a dull conventional work within which no fault and no inspiration is to be found. A bibliography of 456 recent papers will prove valuable to other investigators.

---

## JOURNALS.

BRITISH JOURNAL OF OPHTHALMOLOGY. May, 1922.—The principal interest of this number is pathological. Mr. Foster Moore records an unusual case of renal retinitis. The patient was watched and his fundus condition carefully recorded at intervals during seven years. At first the usual changes characteristic of the disease were noted, and there was a rather small retinal detachment below in each eye. After seven months all the fundus changes were retrogressing, the detachments had disappeared, and the patient was extraordinarily improved in health. After fifteen and a half months there was no trace of albumin in his urine, though the blood pressure was still 190 mm. During the war he was working overtime in a small-arms factory. Seven years after first being seen he died of uræmia, the retinitis having completely subsided and leaving comparatively slight signs. This case of a man of 42 who survived for an exceptionally long time after the onset of retinitis is of interest as bearing on the prognosis in these cases. —Mr. Humphrey Neame records a case of tuberculous iridocyclitis and parenchymatous keratitis of the left eye, associated with tuberculosis of the conjunctiva of the right eye, and tuberculous lymphadenitis. Figures of the pathological conditions present are included.

IN the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS for May, Capt. Alexander Mearns, R.A.M.C., discusses the chronic effects of inhalation of suffocating gases, chlorine, phosgene, chlor-picrin, and trichloromethylchloroformate. He notes that these effects may appear either during convalescence after a severe gassing in the field, or during prolonged exposure to low concentrations of noxious gases, during work, for example, in gas factories. One class of case is purely functional, and occurs particularly among the lightly gassed; it is a definite gas neurosis, presents the signs and symptoms of the effort syndrome, and is best treated in a high oxygen chamber, but its severity depends on the instability of the patient. The organic change in the lungs shown in another group of cases may be fibrotic, emphysematous, or bronchitic. The fibrotic variety has an insidious onset with dyspnœa on exertion and orthopnœa at night, a dry cough, perhaps hæmoptysis and loss of weight; respiration is shallow, as the movements of the diaphragm are much restricted, and there is peribronchial fibrosis and hypertrophy of the right heart. These all resemble the changes in pneumokoniosis. The emphysematous type is generally a consequence of the other varieties, but may at times itself arise somewhat acutely. The bronchitic type may so closely simulate pulmonary tuberculosis as to require X ray and laboratory examination for differentiation. Gassing is by some authors held to predispose to tubercle; Achard's experiments on guinea-pigs seem to indicate the contrary, and among the cases of gas-poisoning quoted in the literature only some 2 per cent. developed tubercle, and even in the cases which seemed decisive the possibility of latent tubercle cannot be excluded. Captain Mearns concludes that the inhalation of gas has an extremely small influence on the occurrence of tubercle of the lung.

# THE LANCET.

*LONDON: SATURDAY, JUNE 10, 1922.*


## Health and Efficiency in the Pottery Industry.

THE application of physiological knowledge to industrial processes continues to be extended by the Industrial Fatigue Research Board, in the interests of those employed. The latest instance is to be found in an investigation carried out in earthenware and china factories.[1] The ware is first modelled from damp clay in potters' shops, which communicate directly with heated stoves where this "green" ware is placed to dry before being passed on to be burnt in kilns. Prolonged controversy, which has engaged the attention of Departmental Committees and H.M. Inspectors of Factories, has centred on complaints that the hygiene of potters' shops is deleteriously affected by back draughts of hot and moist air escaping from the stoves into the workrooms. The object of the inquiry now reported upon was to investigate the physiological aspect of this problem. Although no general agreement exists as to the most suitable temperatures for industrial work, previous inquiries of the Board have provided observations made in the boot and shoe trade, in weaving sheds, and in engineering factories, which may usefully be compared with the extensive data now presented.

Dr. H. M. VERNON and Mr. T. BEDFORD, joint authors of the first part of the report, which deals with atmospheric conditions in potters' shops, point out that the work of the potter is continuously active, but not heavy. They suggest 62·5° F. as an ideal temperature for the work; and hold that this temperature can be maintained when outdoor temperature is low and need only be exceeded on warm days. A temperature curve representing a practical ideal according to outdoor conditions is given. Systematic investigation in potters' shops disclosed that conditions varied with the type of drying stove used; leaf and draw-out stoves gave an average excess of temperature of 7° over that found in an engineering workshop which approximated to the ideal; dobbin stoves gave an excess of 6°; chamber stoves came nearer to the ideal; while some cabinet stoves gave good and others inferior results. On the whole, the contention that the air of potters' shops is unduly warm was corroborated. Contrary to expectation, however, the air in potters' shops was not found to have a greater relative humidity than that of engineering shops, or of boot and shoe factories, or, indeed, of outside air at similar dry-bulb temperature; though, having regard to the high temperatures met with, the absolute amount of moisture present was greater. It is now established that while temperature and moisture are important, the cooling power of air, which is a function of rate of movement as well as of warmth and humidity, is the physiologically important matter. The (median) velocity of the air currents in potters' shops was found to be 17 ft. per minute in winter and 21 ft. in summer, whilst that in boot and shoe shops was 35 and 37 ft. respectively, or nearly double as much. Thus the cooling power of the air, as estimated by the kata-thermometer, is only 5·6 and 4·5 on an average for winter and summer observations respectively: whereas in boot and shoe shops it is 7·4 and 6·4. A matter of some interest not previously investigated is raised here: the authors point out that the movements of the workers themselves in carrying out industrial operations must be added to the velocity of the air in order to arrive at the cooling power of the atmosphere to which they are exposed; and that, within certain limits, the more an operative moves in the course of his work, the less should he notice whether a workshop is well or badly ventilated. If these movements are unduly active, heat due to increased metabolism may outweigh the increased cooling power, but under normal conditions in a quiet atmosphere an advantageous stimulus may in this way accrue to the workers. (Is this an explanation of why many brain-workers when dictating walk the office floor?) In this inquiry, however, as the movements of the potters do not exceed those of workers in other industries cited—they fall short of the movements of mule-spinners in cotton-mills—the comparisons made are not invalidated. The evidence collected shows that potters' shops in general are kept at a considerably higher temperature than that considered suitable to other industries which require work of a corresponding degree of activity on the part of the operatives. This excess of heat is dependent largely on the faulty structure of the drying stoves, though potters themselves are to some extent responsible. They are careless about keeping the stove doors shut, as well as being indolent about opening windows. Nearly all the windows were found shut until the shop temperature reached 67° to 70°, in spite of the fact that the windows, being usually of the hopper type, caused no direct draughts when in the half-open position. Even at a temperature of 80° only two-thirds of the available window space was kept open. The reason given is that potters have, for the most part, been engaged in the industry since the age of 14, and they have got so acclimatised to the heat that they feel uncomfortable without it. The result, however, must manifest itself in lower basal metabolism, and a greater liability to respiratory affections; and the suggestion is made that herein may be found an influence, secondary to exposure to pottery dust, contributing to the high mortality from phthisis and respiratory diseases experienced in the pottery industry.

The second part of the report, written by Dr. VERNON alone, deals with the efficiency of various types of drying stoves. It is somewhat technical, and its main interest is the rehabilitation of the old theory, that in the drying of ware of moderate size high temperature is the chief requisite. He further holds that mechanical efficiency coupled with the best workshop conditions for human efficiency, can be attained only by preventing nearly all back draught, and by installing an independent system of warming the shops. The whole report, which is an excellent one, establishes yet again that there is rarely any incompatibility between conditions advantageous for technical and for hygienic efficiency.

[1] Two Investigations in Potters' Shops. By H. M. Vernon, assisted by T. Bedford. Industrial Fatigue Research Board. Report No. 18. Pp. 74. 1922. Price 2*s.* 6*d.*

## Recent Work on Yellow Fever.

IT is a little over 50 years since OBERMEIER made an important contribution to medical science by the discovery of the spirochæte of relapsing fever, but it has been left until now for success to be obtained in the exploration of the group to which his organism belonged and the recognition of other important pathogenic species. The attack upon the spirochæte dates from SCHAUDINN'S demonstration of the *Treponema pallidum* in 1905, and since then rat-bite fever and Weil's disease have each been traced to causal organisms within this group. Few scientists have contributed more to the solution of the difficulties which beset this branch of bacteriology than has NOGUCHI, and it is fitting that the most recently discovered pathogenic member of the spirochætal group should have been brought to light through his efforts. The previous workers upon the problem of yellow fever, pursuing their subject in the dark, but yet with most admirable logic, had greatly narrowed the field of inquiry. The organism was unknown, but its habits were recognised; the conditions of its transmission by the Stegomyia mosquito were exactly worked out, its filtrability was proven, and conjectures were freely hazarded, by the late Sir PATRICK MANSON amongst others, as to its protozoal nature. The numerous claimants for the pathogenic rôle in this disease had been separately investigated by STERNBERG and rejected. In a word, the properties of the germ were to a large extent known, but it had never been seen.

This was the position when HIDEYO NOGUCHI, who has summarised the history of investigations on yellow fever in an admirable contribution to the Congress of the Royal Institute of Public Health, just concluded, commenced his investigations at Guayaquil as a member of the Yellow Fever Commission of the International Health Board. He examined a large number of cases diagnosed as yellow fever, and systematic attempts to infect animals of many species were made on an extensive scale. Success only attended his efforts in the case of the guinea-pig, where, out of 74 animals inoculated with the blood obtained during the first week of the disease, eight, representing material derived from seven cases of the malady, acquired a disease characterised by a rise of temperature four or five days after inoculation, followed by jaundice a few days later, and often ending in death. In the organs of the first animal which succumbed to the disease NOGUCHI [1] was able to detect a spirochæte, and in further experimental infections, obtained both by passage from animal to animal and by the inoculation of human material, this organism was constantly found where symptoms of the disease developed. Further, cultural methods, akin to those devised by this author for the cultivation of the spirochætes of syphilis and infective jaundice, gave positive results, not only when the material used for inoculation came from the infected animals, but also in a number of human cases, in some of which it was also possible to demonstrate the organism in the blood by use of the dark-ground condenser. This organism, which NOGUCHI has termed the *Leptospira icteroides*, very closely resembles the *Leptospira icterohæmorrhagica* of infective jaundice, and it was necessary to show that the two were not identical, and that the disease in Guayaquil was in fact yellow fever and not spirochætal jaundice. This would appear to be proved by a number of points in the behaviour of the organism in the animal body. For example, the urine in Weil's disease has been found to be rich in spirochætes in the early days of convalescence, whilst the *Leptospira icteroides* is hardly seen in the urine, which is usually non-infective. Further, the latter organism disappears from the tissues of the moribund animal, and in this it also contrasts with the *Leptospira icterohæmorrhagica*, which would appear to be a much more resistant organism. Immunologically, moreover, the two organisms appear distinct, agglutination and the Pfeiffer phenomenon differentiating them, whilst recovery from the one, consequent upon a non-fatal attack, does not confer resistance towards infection with the other; although here the distinction is less absolute. It is concluded that, although not identical, the two organisms are closely related, as, in fact, are the clinical conditions to which they give rise.

With regard to the further agreement of the characters of this organism with the previously determined facts about the nature of the yellow fever virus, it has been found that the organism will pass through Berkefeld filters, the filtrates being infective although showing no visible organisms. This observation has raised again the interesting question of the existence of a granular infective phase in the life-history of the spirochæte; a phase which LEISHMAN [2] believes that he has observed in relapsing fever, and ANDREW BALFOUR [3] has upheld in the spirochætosis of fowls. Some experiments directed towards the transmission of yellow fever to animals by the Stegomyia mosquito were successful. In one case it was possible to infect guinea-pigs by the bites of mosquitoes previously fed on patients ill with the disease, and in another to transmit the disease from guinea-pig to guinea-pig by this means. In this connexion the interesting observation was made that the latent period of 12 days, which must elapse before the mosquito fed upon human-infected blood becomes virulent, is shortened to eight days in the case in which the insect feeds on the animal. What happens in the body of the mosquito is still an unsolved mystery; but NOGUCHI utilises this fact to suggest that, since the infection in the animal is a much heavier one, the shortened latent period would point towards a simple pullulation of the organisms, which requires to reach a certain concentration before the inoculation effected at biting is heavy enough to cause infection—a presumption against the existence of a special developmental cycle in the insect's body.

[1] Noguchi: Etiology of Yellow Fever, Journal of Experimental Medicine, vol. xxix., No. 6, 1919, and succeeding numbers.

[2] Leishman: Mechanism of Infection in Tick Fever and Hereditary Transmission of Spirochæta Duttoni in the Tick, Trans. Soc. Trop. Med. Hyg., London, 1910, vol. iii., p. 77.

[3] Balfour: Spirochætosis of Sudanese Fowls, Fourth Report of Wellcome Research Laboratories, Khartoum, 1911, p. 76.

## "Brain."

A WIDELY representative gathering of British neurologists assembled on May 26th to do honour to Dr. HENRY HEAD on the occasion of his retiring from the editorship of *Brain*, a position which he has occupied for some 17 years. The veteran Sir DAVID FERRIER, one of the founders and original editors of the journal, which is now half a century old, was happily able to attend and by his presence to form a living link between the old era and the new; Dr. PERCY SMITH, too, on whose shoulders the editorial burden had fallen in somewhat difficult times, Dr. GORDON HOLMES, who succeeds Dr. HEAD in the editorial chair, and many others who at one time or another have acted on the committee of *Brain*,

including the chairman Prof. Sir CHARLES SHERRINGTON, united both to demonstrate the continuity of its management and to indicate their appreciation of the signal services rendered by Dr. HEAD during his long tenure of office. Outside neurological circles it is doubtful if the truly international reputation earned by *Brain* is adequately recognised. A special journal of this kind can never, perhaps, expect to have a really large circulation, but what is lost in numerical comparison with others is gained in the quality of indispensability. No serious worker in the schools of neurology at home or abroad can afford to be in ignorance of the contributions its pages contain; many of these, indeed, have become classics in the history of the study of the nervous system and its diseases. Thanks largely to the devoted labour of Dr. HEAD in maintaining and raising the level of the articles it has published, *Brain* has had no lack of contributions from sources outside this country, yet it has throughout kept a character of its own; it has been within the last few years, more particularly, the medium of expression of that impetus to research along physiological lines which is characteristic of English neurology to-day, and which is due in very large part to the lead given by Dr. HEAD himself. An editor to whom the epithet "great" will come with justice to be applied must not merely accept passively only such contributions as are suitable, but must be active on the formative side, must as it were "set the pace," must, in short, have a policy of his own and not one derived secondarily and incidentally from without. Of Dr. HEAD it may fairly be said that during his long control of the journal with which his name will remain associated he has shown a younger generation of neurologists what to work at and how to work, and this is his reward. The reputation of the premier English neurological journal has never stood higher than it does to-day; rivals have appeared, or, rather, journals both on the psychological and the neurological side of medicine which contain features that have never been specially developed by the older periodical, and in so far as one or other of these is directed by workers who have learned from Dr. HEAD there is surely reason to feel that their existence and success are a compliment, genuine enough if indirect, to his tuition. *Brain*, however, with 50 years of continuous endeavour behind it, has reached a position of pre-eminence to which it is abundantly entitled and of which it cannot ever be deprived. We believe it is one of the rare journals whose back volumes have appreciated in value. Obviously a publication of this kind is a highly prized asset to the specialty it serves. As far as we can judge, the omens are propitious for its continuing to render valuable aid to the progress of neurology not only in England but wherever the English language is read and understood. Our wish for it is that it should still attract the best minds in its own department, as it has done in the past, and should continue to form the best medium for the interchange of neurological opinion and for the advancement of the study of the nervous system in all its branches.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The syllabus of the week's post-graduate course in diseases of children is now available and copies will be forwarded on application to the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1. Clinical lectures and demonstrations will be given by members of the staff in the various departments of the following institutions: July 3rd, East London Hospital for Children; July 4th, Paddington Green Children's Hospital; July 5th, Victoria Hospital for Children; July 6th, Queen's Hospital for Children; Jule 7th, St. Marylebone General Dispensary.

# Annotations.

"Ne quid nimis."

## BIRTHDAY HONOURS.

THE list of honours conferred last week-end on the occasion of H.M. the King's 57th birthday contains the names of men and women eminent in various branches of medical work. Sir Berkeley Moynihan, who has founded the most outstanding school of surgery in this country, receives a baronetcy. Knighthoods have been allotted to Dr. H. Kerr Anderson, F.R.S., since 1912 Master of Gonville and Caius College, Cambridge, and sometime University lecturer in physiology, and to Prof. W. M. Bayliss, F.R.S., whose chair of general physiology at University College, London, has enriched the practice of medicine in many directions, notably the application of scientific principles to nutrition and circulation. Other medical knights are Dr. John Macpherson, until lately medical commissioner in lunacy for Scotland, and now professor of psychiatry in the University of Sydney; Dr. A. J. Rice-Oxley, thrice Mayor of Kensington; and Dr. David Maurice Serjeant, who has filled many spheres since taking his M.D. at Aberdeen University just 60 years ago. Closely associated with big problems of health are the knighthoods conferred on Mr. E. J. Russell, D.Sc., F.R.S., director of the Rothamsted Experimental Station, and for a time technical adviser to the Food Production Department; and on Mr. William Walker, recently directing health and safety in the Mines Department of the Board of Trade, and chairman of the Mining Dangers Research Board. A knighthood has also been conferred upon Mr. H. A. Barker, described officially as specialist in manipulative surgery, who placed his manual dexterity unreservedly at the disposal of all ex-Service men. In the Order of the Bath, knighthoods are given to Sir Robert Hill, Director-General of the Medical Department of the Navy, and to Major-General A. P. Blenkinsop, Deputy Director of Medical Services in the Eastern Command. Mr. R. R. Cruise, F.R.C.S., Surgeon-Oculist Extraordinary to H.M. the King, receives a K.C.V.O. In the Indian Civil Service, Major A. W. Lynsdale, acting professor of materia medica at the Madras Medical College, becomes Companion of the Imperial Service Order. The Kaisar-i-Hind Medal for public services in India is awarded to Dr. Edith M. Brown, principal of the Women's Christian Medical College at Ludhiana; to Dr. Susan Campbell, in charge of the Scottish Zenana Hospital at Rajputana; and to Miss Eleanore Thompson, lady superintendent of the Calcutta Medical College Hospital. Other hospital benefactors whose work is officially rewarded are Lieut.-Colonel Emmanuel Hoyle, of Huddersfield (baronetcy), and Mr. E. M. Iliffe, of Coventry (knighthood). Dr. A. E. Horn, director of medical and sanitary services in Malay, receives the C.M.G. To all these public servants THE LANCET offers warm congratulation.

## THE FUTURE OF VITAL CAPACITY TESTS.

SINCE the publications in THE LANCET on the vital capacity, by Prof. G. Dreyer[1] and Dr. L. S. T. Burrell,[2] several papers have appeared on this subject, and all seem to show that the test is of real value in diagnosis, treatment, and prognosis. A paper by Dr. C. Lundsgaard and Dr. K. Schierbeck[3] has added much to our knowledge of the vital capacity in health, and Dr. J. A. Myers[4] has published a comparison of the vital capacity with the X ray findings in pulmonary tuberculosis which defines the sphere of each. The former gives a measure of the

[1] THE LANCET, 1919, ii., 227. [2] Ibid., 1920, i., 1212.
[3] Hospitalstidende, Jan. 25th and March 15th, 1922.
[4] American Review of Tuberculosis, January, 1922.

functional capacity of the lungs, while the X rays indicate the nature and extent of the disease. Neither method is infallible, both are very valuable.

The most recent contribution to the subject is by Dr. C. Cameron,[5] of the Glasgow Sanatorium, Ochil Hills, who has carried out valuable research at a public sanatorium under conditions which are disheartening to many people. Dr. Cameron followed Prof. Dreyer's technique, and his material consists of 198 cases, as many as 102 of which were in the second stage (Turban-Gerhardt) of pulmonary tuberculosis. It was found that whenever the patient showed clinical signs of improvement there was also marked improvement in the vital capacity, the two coinciding "in an almost mathematical manner." Increase of vital capacity was often associated with increase of weight, but there were cases in which there was little or no increase of weight while the vital capacity and other signs showed great improvement. This particular finding suggests that mere accumulation of fat is not necessarily indicative of health, and is often more an embarrassment than a helpful reservoir of energy to the patient. Indeed, in some cases the course of the vital capacity was opposite to that of the weight. A curious observation made by Dr. Cameron was that in many cases the vital capacity diminished during the first few weeks in the sanatorium, the result, as he suggests, of a "negative phase" induced by the sudden change of environment. The influence of an attack of simple coryza on the vital capacity was found to be considerable, suggesting that this complication in the subjects of pulmonary tuberculosis is far from being a negligible evil. The greatest diminution of vital capacity was by 76·7 per cent. In another case a diminution by 76·2 per cent. occurred in a patient who ultimately recovered. Dr. Cameron does not claim infallibility for the test under discussion, and he insists that vital capacity findings should supplement, not replace, judgment based on clinical findings. By itself it is of no value as an absolute standard. With regard to its diagnostic possibilities he has not been able to verify Hutchinson's claims; Dr. Cameron's material consisted of sanatorium patients in whom the diagnosis of pulmonary tuberculosis had already been made by ordinary clinical methods before admission. But as 194 out of 198 cases with definite signs of intra-pulmonary disease showed a diminution of vital capacity exceeding 10 per cent., and as 173 showed a diminution exceeding 20 per cent., it is obvious that this test is remarkably reliable, provided the non-tuberculous causes of a diminished vital capacity can be eliminated. As a guide to the effect of treatment a series of vital capacity readings is of striking value, for a constant increase invariably implied definite improvement. Of the two factors determining the vital capacity, toxæmia and structural changes, Dr. Cameron regards the former as the more important early in the disease. In the more advanced stage the pathological-anatomical changes in the lungs play a comparatively important part. Advancing disease is always associated with diminishing vital capacity, but limited capacity does not necessarily in its turn indicate advancing disease.

The publications to which we have referred afford solid ground for the forecast that vital capacity tests may soon form part of the routine of medical examinations for life insurance. The prophecy may also be ventured that the time may not be far distant when, in civilised communities, every person's vital capacity will be periodically tested with the same conscientiousness that is at present devoted to the weights of babies. At present the value of vital capacity readings in disease is seriously diminished by the fact that the normal standard has to be calculated by an impersonal formula. Had the patient's actual vital capacity been ascertained before he began to fall ill, the extent to which his health was impaired could be gauged far more accurately than it is at present. Already in many colleges, public schools, and universities in the United States a permanent record is made of the vital capacity of every enrolled student. As Dr. Myers points out, industrial organisations will find it well worth their while to record the vital capacity of every new employee. Disease may then be detected which would otherwise have escaped observation, and subsequent readings should be of value in the detection of early disease and in showing whether it was contracted before or after the employee's engagement. Only a few years ago the tests by which the effects of sanatorium or other treatment for pulmonary tuberculosis could be checked were few and deplorably unreliable. They were the temperature, weight, pulse, presence or absence of tubercle bacilli, and physical signs. The prognoses founded on these criteria were often stultified by the event, and little wonder. Now a far more trustworthy estimate of a patient's chances of recovery can be formed, thanks to the indications given by such things as vital capacity readings, the skin reaction to tuberculin, the Wildbolz auto-urine skin test, the blood pressure, and the rate of sedimentation of the red corpuscles. To the lay mind tests and signs will seem less important than "treatments." But the prospects of stamping out tuberculosis are steadily brightening, not so much because of direct advances in therapeutics, intriguing though eleventh-hour cures may be, as because of new tests and signs which enable us to recognise and abort this disease at an early stage.

[5] Tubercle, May and June, 1922.

## PREVENTION OF RICKETS BY LIGHT RAYS.

IT is now established by the researches of Hess, Unger, and Pappenheim, and confirmed by independent observers, that the development of rickets in rats fed on the standard rickets-producing diet of Sherman and Pappenheim can be prevented by daily exposure to direct sunlight for 15 minutes. These observers have continued their researches on the prevention of rickets in rats by light rays.[1] If the rats are placed in a box having flint glass windows, it was found that the sun's rays which had traversed the glass had lost their penetrative power, but rays reflected to the rats from a white surface retained some of their efficacy. Rickets can be prevented in rats by daily exposures of about two minutes to the rays of the mercury vapour quartz lamp, or by four minutes or less exposure, at a distance of three feet, to the rays of a carbon arc lamp. X rays were found to be ineffective. In order to test the effect of the pigment of the skins on the protective action of light, a group of white and another of black rats were exposed to the radiations of the mercury lamp—exposures of one and one and one-half minute being used. It was found that all the white, but none of the black rats were protected. The black rats showed rickets by X ray and by pathological examination, and their blood contained a less percentage of inorganic phosphate. These experiments show that pigment retards the rays which are effective in the cure of rickets, and indicate one factor in the exceptional susceptibility of negro infants to this disorder. It was also found as regards scurvy that exposure to direct sunlight failed to prevent or delay its onset in guinea-pigs.

The same observers also contribute an interesting note on the spontaneous cure of rickets in rats, observed during an experiment on the curative effect of sunlight in the rickets of rats. It has long been believed that in infants healing of rickets occurs in spite of the diet and environment remaining unchanged. Rats were placed on a diet which furnished a level of phosphorus inadequate for the rat and leading to rickets. All the four rats receiving this diet showed signs of rickets, according to X ray, after 32 days. After 48 days, however, the radiographs showed healing, and after 74 days, X-ray showed the lesions apparently healed; and no gross evidence of rickets was found at the autopsy, and microscopic observation showed no evidence of active rickets. The rickets was either healing or there was merely

[1] Soc. for Expt. Biol. and Med., xix., 1922.

osteoporosis. During the 48 days the rats had made a total gain of 92 g. The explanation suggested for this spontaneous healing is that with a practically stationary weight over a long period, the phosphorus requirement for the building up of new tissue is greatly reduced. The small addition of phosphorus under these circumstances, to the standard rickets-producing diet, suffices to enable the bone to recalcify.

## MENTAL HOSPITAL ADMINISTRATION.

AT the present time there is a wave of prejudice against mental hospital administration. The following extract from an appeal for funds by the National Council for Lunacy Reform (N.C.L.R.) will illustrate the kind of statement that is frequently made.

> We do not urge our steps on insufficient grounds in any spirit of alarmed fanaticism. The Council has the overwhelming evidence of the evils which exist. Even the Minister of Health has admitted that under present conditions lunacy is treated as a crime rather than as a disease, and that there is a most urgent need for reform. The almost entire lack of curative hospital conditions make asylums prison-houses for the mentally afflicted. We ask for curative hospitals in which there shall be no stigma of certification for curable cases. We demand a complete end of the present obsolete system.

It will be observed that sweeping accusations are made without evidence, and they are so worded that no reply is possible. The Minister of Health, in a letter to Lord Henry Bentinck, treasurer of the N.C.L.R., dated May 11th, explains that he is misquoted, and though the misrepresentation was subsequently withdrawn, it is not clear that the withdrawal reached all the persons to whom the original appeal was sent. These repeated attacks on mental hospitals are likely to do serious harm in discouraging the medical men and women who are devoting themselves to the treatment of the insane, since everything critical of their work is published, whilst little on the other side gets a hearing. Two illustrations of this have occurred recently. The newspapers gave details of sensational accusations made by witnesses at the public inquiry recently held by the committee appointed by the Minister of Health, but practically nothing was published concerning the evidence of witnesses favourable to the hospital administration. Again, in the recent Cox case, an ex-police sergeant made the most serious charges against the staff of a public mental hospital; at the inquiry on oath made by the Board of Control these charges were shown to be false, and even those witnesses brought by the complainant himself did not substantiate his accusations. Yet one paper in reporting the case said that though the Board of Control could have come to no other decision, it did not follow that there was no cruelty.

This absence of fair-play is deplorable; veiled accusations and insinuations are being made freely; but if shameful things happen, is it not the duty of those who know of them to report them to the recognised authority which possesses full powers to examine on oath? Is it not cruel to the patients alleged to be maltreated to keep back information, and to demand instead the appointment of a Royal Commission? With reference to the treatment of ex-soldiers, anyone familiar with recruiting methods during the time of grave national stress will not be surprised at finding a number of chronic insane amongst ex-Service men. To blame the mental hospitals that these are unrecovered, or to imply that they are cases of nervous disorder such as shell-shock or hysteria, shows a grievous want of knowledge, if not a wilful misrepresentation of the facts of the case. But in this agitation anything that will prejudice public opinion against the mental hospitals will suffice, and these are blamed because soldiers die of general paralysis or sink into vacuity from dementia præcox. We cannot but fear that such unfair attack will tend to prevent men of ability and enthusiasm from taking up this most difficult department of medicine, whilst it will gravely discourage the large numbers of medical men and women who are now giving their strength to this work. Moreover, the public prejudice against the mental hospitals will render it even more difficult to induce women of the right type to take up a branch of the nursing profession which is peculiarly trying and which brings few rewards.

There are about 100 public mental hospitals in England and Wales. They cannot be all equally efficient, and in some the standard of work may be not all that we desire. Yet the medical superintendents of mental hospitals are all the time pressing for improvements; perhaps the most trustworthy criticism of the existing regime will be found in the Status Committee's report to the Medico-Psychological Association, published in 1914. From this we see that alterations and reform in certain respects have long been urged by members of this association of medical men engaged in the work of treating insanity. If only future agitation be conducted with scrupulous fairness good may yet come of it; the conditions under which medical officers live may be improved, junior medical officers may obtain facilities for study leave, have normal opportunities for marriage, and a more adequate staff of doctors and nurses may be provided. It is obvious that much more individual attention could be given to patients than now generally obtains if the staff were larger, and the awakening of public conscience with regard to the welfare of the insane may render those and other improvements possible.

## POISSON'S FORMULA.

IN another column Mr. G. de M. Rudolf has drawn attention to the need in statistical tables dealing with the results of medical observations to give a statement of the variations which mere chance might produce in the stated results. As is well known, assuming that observations are accurate and comparable in kind, the relative value of two series varies as the square root of the number of observations, and Poisson's formula is commonly employed to determine the possible accidental range. Mr. Rudolf makes a double suggestion: first, that in statements of medical statistics a graphic method should be employed in plotting out results, and, secondly, that two additional curves should be made, one showing the possible excess above and the other the negative deficiency below the recorded facts, according to Poisson's formula. The procedure suggested would be useful in reminding observers of the errors lurking in deductions from a limited number of observations: a caution which is required not only in statement of pathological results, but even more in adjudication of the merits of a given therapeutic measure.

## CYSTS OF THE LABIA MINORA.

ACCORDING to Dr. J. Duvergey and Dr. J. Fichez,[1] of Bordeaux, who record an illustrative case in a woman aged 40, cysts of the labia minora are comparatively rare. L. Weber, in his thesis published in 1898, collected 21 cases, the first having been recorded by Boys de Loury in 1840 and the second 10 years later by Hughier, since when examples have been described by Morestin, Prat, Macgregor, Bluhm, Péraire, Fredet, Riche, Wladimiroff, and Biondi. The cysts usually develop on the free margin and outer surface of the labia, and, as a rule, are pedunculated. They project from the vulva and do not give rise to any serious symptoms. With the exception of multiple cysts reported by Bluhm and Howard Kelly, the cysts in all the recorded cases were single, their size varying from that of a pea to that of an orange. The writers divide cysts of the labia minora into two groups, the first and most numerous being sebaceous cysts, and the second, of which their own case is an example, mucous cysts. Sebaceous cysts are usually situated on the outer surface of the labia minora, where sebaceous glands are extremely numerous, numbering, according to Martin and Léger, 130 to 140 to the square centimetre, as

[1] Gazette Hebdomadaire des Sciences Médicales de Bordeaux, May 7th, 1922.

compared with 28 to 30 on the inner surface of the labia. Up to puberty the sebaceous glands remain inactive, reaching their greatest development during pregnancy. Mucous cysts have been variously regarded as of lymphatic origin (Bluhm and Weber), as derived from mucous glands (Bégouin), the existence of which in this region is doubtful, or from aberrant Bartholinian glands (Forgue and Massabuau), which the writers consider the most probable explanation. The prognosis is always favourable. Though the cyst may suppurate and give rise to a fistula, malignant degeneration has never been recorded. Treatment consists in extirpation under local anæsthesia followed by a plastic operation on the labium. The wound usually heals within a fortnight, and recurrence is unknown.

## INFECTIOUS DISEASES AND STARVATION.

IN an address recently delivered at the Obuchow Hospital in Petrograd, Dr. A. Sternberg[1] gives an account of his observations on the course of acute infectious diseases in that city, where from the end of 1917 to the end of 1919 all the influences injurious to health had become accumulated to an extraordinary degree. Not only were the most essential hygienic requirements such as drainage, closets, public and private baths entirely lacking, but the whole population was suffering from hunger. With the exception of a few dozen persons, no one was able to maintain his caloric equilibrium—in other words, everyone was more or less undernourished. During this period Petrograd was visited by a number of more or less severe epidemics—viz., typhus, typhoid, relapsing fever, cholera, dysentery, influenza, and measles. In spite of the unfavourable conditions prevailing, both clinical observations and statistics showed that the course of acute infectious diseases was not more severe than in previous years; in dysentery and measles only was the mortality much higher than before. Of chronic infections tuberculosis showed no tendency to run a more rapid or unfavourable course as the result of underfeeding than in previous years. Thus the mortality from typhus in the Petrograd hospitals was 9·4 per cent. in 1918 and 11·8 per cent. in 1919, as compared with an average mortality of 12·2 per cent. during the last 30 years. The mortality from dysentery in 1918 was 45·5 per cent. and in 1919 29·5 per cent. as compared with an average mortality of 22·2 per cent. for the last 30 years. Measles in 1918 did not present an epidemic character, and its mortality for that year was relatively low, —viz., 10·28 per cent.—but in 1919 there were 2058 cases with 667 deaths, or a mortality of 34·1 per cent., as compared with an average mortality of 13·3 per cent. for the last 30 years. Dr. Sternberg attributes considerable importance to the premature senescence produced by starvation through changes in the endocrine glands, especially the thyroid and the sexual organs. Not only were amenorrhœa and loss of sexual appetite and potency extremely frequent, but there was a great diminution and almost complete disappearance of hyperthyroidism. The effect of this premature senescence was to modify the character of infectious diseases so that, with the exception of measles and dysentery, the illness ran a less violent course than in younger persons.

## THE CAUSES OF ACUTE INTESTINAL OBSTRUCTION.

EARLIER diagnosis and prompter treatment are the patient's chief need in acute intestinal obstruction as in other acute abdominal incidents. Mr. D. P. D. Wilkie, in the instructive address which appears on p. 1135 of our present issue, approached the subject from the pathological side. He drew attention to the three distinct mechanical types of obstruction: (1) Simple obstruction in continuity; (2) the closed loop or blind sac; (3) the strangulation where the blood-supply is interfered with. In simple obstruction the three main factors threatening life are dehydration, toxæmia, and splanchnic paresis; in closed-loop obstruction toxæmia and, later, gangrene of the loop and peritonitis. In strangulation shock is of primary importance, and may kill the patient before the inevitable toxæmia has had time to play a part. Our surgical treatment must include measures to combat shock, dehydration of the tissues, toxæmia, and splanchnic paresis. Therefore morphia, subcutaneous saline in large amount, gas and oxygen anæsthesia with minimum handling and exposure of intestine at operation, and pituitrin and enemata after operation, will form essential parts of our treatment. Special attention must be paid to the "poisonous proteose level"—i.e., the duodenum and upper jejunum; where the distension has told back to this level, measures must be taken to ensure its rapid evacuation. Mr. Wilkie's address should be read with care by practitioners, for it is they who may be called upon at any moment to decide the import of acute abdominal symptoms.

[1] Deutsche medizinische Wochenschrift, May 5th, 1922.

## THE MANCHESTER ABLUTION CENTRES.

As we have already announced, the Manchester City Council decided by a vote of 54 to 31 to close the ablution centres established two years ago for the use of men who had run the risk of acquiring venereal disease. Closure of these centres was not advocated entirely or mainly on the ground of expense, for the actual running costs must be small. The Manchester centres simply use the accommodation of two ordinary street urinals where the attendants are specially trained in the technique of disinfection. A preliminary conversation takes place in the anteroom provided for the washing of hands, and one of the water-closets is used for the irrigation and application of calomel cream. Attendance at one of these centres has recently averaged about 20 a night. Inquiry is made by the attendant in every case as to the length of time which has elapsed since the risk of infection was incurred, and treatment is refused where this period exceeds 12 hours. Any indication of existing disease also leads to refusal of treatment. When refused, the man is given a numbered card referring him to one of the venereal clinics, the card requesting return by the medical officer to the Health Department of the city. Sixty-five per cent. of these numbered cards have, we understand, actually been retrieved, whence it is evident that the ablution centres have been instrumental in bringing under treatment a number of men who might not otherwise have applied. The question is asked of any man first attending a venereal clinic in Manchester whether or not he has received treatment at an ablution centre, and so far the answer has never been in the affirmative. It appears, therefore, that the ablution offered is efficacious. But the motives which actuated the Council, although doubtless multiple, were those set forth by the Bishop of Manchester at a recent Diocesan Conference, in which it was said that the maintenance of these centres was likely to set up a false sense of security, leading young people to regard irregular sexual intercourse as a normal incident in life, and thus in the long run to cause an actual increase in the number of persons infected. Resolutions to similar effect were received by members of the Council from the Catholic and Free Church Federations. A town councillor, in seconding the motion for abolition, suggested that young people, knowing of such places, felt that they could take the first steps with immunity, the city fathers appearing to guarantee their security. It is, however, the experience of the actual running of these centres that only a minute proportion of those attending are of tender age, it being quite exceptional for a man of under 25 years to apply. Since names are not recorded, no precise information can be set out in regard to habitual use of these centres by certain persons; but the attendant in charge believes that something more than one-half only present

themselves on a single occasion, while the remainder reappear at intervals of two to eight weeks or longer. It was stated at the Council meeting without contradiction that the Inquiry Committee appointed by the National Council for Combating Venereal Diseases, which had made investigations in Manchester, had reported unanimously in favour of retaining the centres, but the reasonable plea to postpone action until the report of this Committee was available was turned down by the Council. Alderman Jackson summed up the position of the Public Health Committee when he said: "We say that you should not sin; but if, in spite of all, you have no regard for your moral obligation, and will still do wrong, then, for goodness sake go and cleanse yourself and do not infect innocent people." There are many outside the National Council's Inquiry Committee who will feel regret that the Manchester experiment is being closed before public opinion has had time to judge of the merits of the case.

## IN MEMORY OF F. C. DONDERS.

THE unveiling of a statue of Donders last summer at Utrecht was the occasion for the delivery of a number of addresses on his life and work which have now been translated into German[1] and issued as a pleasant little illustrated *Denkschrift*. Ophthalmologists, the world over, look back to Donders as the founder of modern teaching on the accommodation and refraction of the eye. Of the long list of his works published between 1840 and 1883, most deal with some aspect of the physiology of vision. In 1847 he wrote on the connexion between convergence and accommodation; in 1850 on entoptic phenomena, more about accommodation, and on colour vision; in 1852 on the use of Helmholtz's ophthalmoscope; and in 1853 on the fundi of animals revealed by its use. The great work on the Accommodation and Refraction of the Eye, by which he is best known to English readers, was published in 1864 at the invitation of the New Sydenham Society, in English, the translator being Dr. W. D. Moore of Dublin. It was an expansion of an essay published a few years previously, and will always remain a classic. From that time until a year or two before his death in 1888 he continued a prolific writer, some of his latest contributions to ophthalmic literature relating to the theory of colour-blindness and the testing of the colour vision of railwaymen.

The statue, a photograph of which is published in the brochure to which we have referred, appears to be a worthy memorial to a great man.

---

WE regret to record the death on June 3rd, from an aeroplane accident in the Channel, of Dr. Gordon Ley, obstetric registrar and tutor at Charing Cross Hospital, and already recognised as a gynæcologist of distinction.

---

Dr. Gustave Monod will give a course of demonstrations (in English) on Practical Hydrology at the Thermal Hospital in Vichy from June 19th to 26th. Subjects: Modern treatment of diabetes and spas, Gout and hydrological treatment of its symptoms, Enteroptosis, Hepatism, Disorders of the sympathetic system, from the hydrological point of view. Further particulars can be obtained from the Secretary to the Fellowship of Medicine, 1, Wimpole-street, London, W. 1.

[1] F. C. Donders. Leipzig. 1922. Published by W. Engelmann. 1 florin.

## THE LANCET of Jan. 7th, 1922.

THE Manager will be obliged to readers who have not any further use for their copies of THE LANCET of the above date if they will kindly return them to him at 1, Bedford-street, Strand, W.C. 2. The postage on each number is three halfpence. He will be pleased to pay for those returned.

# GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

SATURDAY, MAY 27TH.

*Dental Business.*

THE Council considered in camerâ a report and recommendations from the Dental Board, after which the PRESIDENT announced that the Council had directed the restorations of the names of Frederick Charles Beaumont, George Charles Smith, and John Winter to the Dental Register.

Sir JAMES HODSDON, chairman of the Dental Education and Examination Committee, presented the Committee's report on the Dental Tables and Exceptional Applications. The report was received and entered on the minutes. Sir James Hodsdon then presented the same Committee's report on the Dental Curriculum. He stated that there were about 500 more names on the Dental Register in 1921 than there were in 1914.—Sir GILBERT BARLING pressed for a specific statement of the necessity for a knowledge of X ray work on the part of the dental practitioner.—Mr. GILMOUR and Mr. GUY reassured the Council as to the encouragement and opportunity which would be afforded to students of making themselves acquainted with X ray work.—Sir GILBERT BARLING, however, proposed an amendment adding radiology to the list of special subjects in which the dental student would be required to attend a course.—Mr. TURNER seconded the amendment, which was carried by a substantial majority.

*Reports by the Examination Committee.*

A report by the Examination Committee on the annual tables and inspection of examinations was received and entered on the minutes. Dr. NORMAN WALKER, chairman of the Examination Committee, then presented the Committee's re-drafted recommendations dealing with

*Professional Examination.*

In November, 1921, the Examination Committee presented its report on the inspection of the qualifying examinations, along with certain recommendations with regard to professional examination. The recommendations, with suggested amendments, were by direction of the Council circulated to all the licensing bodies for their observations. Several valuable suggestions and useful criticisms, requiring careful consideration, were received from various licensing bodies, and the extensive changes in the curriculum proposed by the Education Committee had also to be taken into consideration. The Examination Committee, therefore, re-drafted their recommendations; after discussion by the Council they were adopted in the following form:—

1. In order to secure due continuity and sequence in medical study, two or more professional examinations in the earlier subjects should be held antecedently to the final examination in medicine, surgery, and midwifery.

2. Three years at least should intervene between the date of passing the professional examination in anatomy and physiology and that of admission to the final examination in medicine, surgery, and midwifery.

3. A candidate remitted in any subject of a professional examination should, before he is readmitted to examination therein, be required to produce satisfactory evidence that he has, during the interval of remission, pursued the study of the subject in which he was rejected. Candidates who obtain less than 30 per cent. of the marks in any subject should be remitted for a longer period than three months.

4. In all the professional examinations sufficient time should be assigned to practical work to test the thoroughness of the candidate's knowledge and to encourage practical methods of study.

5. Candidates in all their examination work should be carefully supervised.

6. Two examiners should always participate in the oral examination of a candidate, except in subordinate parts of the practical examination.

7. In all written examinations the questions in each subject should be submitted for the approval of all the examiners in that subject.

8. In all written examinations an average of at least half an hour should be allowed for a candidate to answer each question.

9. It is desirable that examiners, and in particular those for the final examination in medicine, surgery, and midwifery, should be appointed or re-elected for at least three consecutive years.

10. Whatever may be the system of marking, the percentage for a pass in each subject should be not less than 50.

11. In the regulations for the several examinations, including the final, it should be provided that examiners, in assessing marks, be empowered to take into account the duly attested records of the work done by the candidate throughout his course of study in the subject of the examination.

12. The final examination in medicine, surgery, and midwifery, with the exception of practical midwifery, must not be passed before the close of the fifth academic year of medical study.

13. The three portions of the final examination in medicine, surgery, and midwifery should not be further subdivided into sections which may be entered for or passed separately.

14. Compensation in respect of marks as between the three different portions of the final or qualifying examination —viz., medicine, surgery, and midwifery—is contrary to the intention of the Medical Act (1886).

15. The final examination should include clinical and practical examinations in midwifery and gynæcology.

At this point the Council adjourned.

MONDAY, MAY 29TH.

The Council resumed consideration of the recommendations of the Examination Committee with regard to professional examination. The remaining resolutions were adopted in the following form :—

16. The clinical examinations in medicine, surgery, and midwifery should be held in properly equipped hospitals or examination halls, well provided with suitable patients.

17. In the examinations in clinical medicine at least one hour, and in clinical surgery at least half an hour, should be allowed to the candidate for the examination of, and report on, his principal case or cases.

18. The marks obtainable for the written and oral examinations in each of the three portions of the final examination, added together, ought not to be greater than those obtainable for the clinical examination, and no candidate who fails to obtain 50 per cent. of the marks in the clinical examination should pass.

19. The final examination should include the examination of secretions, the testing of urine, clinical microscopy, and prescription-writing, and there should always be an oral examination in medicine, surgery, and midwifery, which should always include an examination on pathological specimens.

20. At the final examination each candidate should be submitted to a practical and oral examination in pathology (macroscopic and microscopic), unless this has been included in a professional examination preceding the final examination.

21. Whatever be the method of entry for the final examination all candidates should be required to complete the three portions of the final examination within a period of 19 months.

*Public Health Committee.*

The Council received and directed to be entered on the minutes a report on the D.P.H. Tables and Exceptional Cases by the Public Health Committee.

Sir JOHN MOORE, chairman of the Public Health Committee, then presented a report of the Committee concerning Public Health Rules. He proposed that they be adopted and come into operation on Jan. 1st, 1924.

Sir GEORGE NEWMAN seconded the motion of adoption, and said that the Council would be severely criticised in connexion with these rules. The two questions which the Council had to decide were (1) is D.P.H. reform necessary, and (2) is this reform the best. He spoke very highly of the services of the late Dr. Bruce Low, whose reports, he said, showed a great breadth of outlook and a close association with the clinical aspects of medicine, gained by 20 years' private practice. The present D.P.H. rules, continued Sir George Newman, were obsolete ; substantial alteration was called for and justified. The rules are to be so severe as to prevent entry of any but those who wish to devote their lives to the public health service. Referring to the insurance system, Sir George Newman said that what was required in that connexion was 12 years' peace.

Sir E. COEY-BIGGER and Dr. MCVAIL supported the motion, and the Council approved the rules *nem. con.*, it being agreed that they should come into operation on June 1st, 1924.

*Conclusion of Business.*

Mr. King was reappointed Registrar to the Council. Dr. MCVAIL then proposed a vote of thanks to the President for his management of the session, referring to the speed of his decisions and to his splendid devotion to the work of the Council. The vote was carried by acclamation.—The PRESIDENT thanked the Council, remarking that no president ever had a Council so ready and loyal in its coöperation with him. He also offered the Council's cordial thanks to Dr. McVail, who is now retiring from the Council, for all his valuable work in the business of the Council.

The Council then considered in camerâ a report by the Finance Committee.

This concluded the business of the session.

## VIENNA.

(FROM OUR OWN CORRESPONDENT.)

*International Lecturing.*

For the past six months it has become quite customary for eminent Viennese professors to be asked to deliver a series of lectures at foreign universities. These invitations have, as a rule, been quite unexpected. Prof. Frankl was invited to Dublin, where he delivered a series of instructive lectures on problems of gynæcology. Profs. Fuchs and Haberer have lectured in Spain and America, the former on ophthalmological subjects, the latter on various surgical topics. Prof. Lorenz spent more than three months in the United States, where he gave a very considerable number of demonstrations on orthopædic surgery and bone-correcting appliances, whilst Prof. Ruttin is going to Holland, where he will deal with the latest surgical advances in otology. Frequent interchange visits are contemplated during the coming year between Austrian and German universities. In spite of the heated national and racial feelings prevailing in the so-called Succession States of Middle Europe, similar arrangements are being aimed at between universities of the countries concerned, and it may safely be assumed that these arrangements will go far to bring about a better understanding between the different countries.

*Marriages, Births, and Deaths in Austria during 1920.*

The head of the statistical department of the Austrian Ministry of Health recently read a paper on social problems, in which he dwelt on the fluctuations in the population of this country in a frank and public manner. He compared the years 1919 and 1920, as the figures for 1921 are not worked out. According to his data, an increase of 6166 weddings took place in 1920, as compared with 1919 ; the total was 83,575. The city of Vienna is, of course, chiefly responsible for both the total and the increase. The figures for births were 142,133, or 26,398 more than in 1919, and the deaths numbered 117,025, or 7824 less than in 1919. 4351 (an increase of 849) children were stillborn, and 21,701 (an increase of 4671) died under the age of 12 months. The mortality of babies of over one year is thus markedly less, owing to the careful attention bestowed on them and to the improved technique of welfare centres. As regards the causes of death, it is gratifying to note that tuberculosis and organic diseases of the circulatory system are less frequently responsible. The mortality in Vienna was 33,672 (a decrease of 5745) ; only in a few rural provinces was a slight rise in numbers noted.

May 30th.

# MATERNITY CONDITIONS IN INDIA.

By MARGARET I. BALFOUR, M.B. EDIN., W.M.S.I.

IT is difficult for dwellers in European countries to realise the amount of suffering endured by Indian women in childbirth, and the extent to which this is responsible afterwards for poor health, gynæcological trouble, and high infant mortality. Labour in India is not unusually difficult. Probably in normal circumstances it is easier and more rapid than in European countries. But in many parts serious abnormalities are common, and in every part, owing to the uncleanly and unhygienic practices which accompany labour, normal cases become abnormal. Osteomalacia is frequent in certain parts of the country, but is never found in others. The reasons for this distribution would make a fascinating subject for research, and it is strange that the Indian Research Fund has not done more to elucidate information in a matter of such acute importance to a large part of the population of India. The frequency of eclampsia in some parts of India is another fact worthy of note which would probably repay skilled investigation.

### *The Prevalence of Puerperal Sepsis.*

Septic infection in all its forms is rampant. This is not surprising seeing that nearly all the midwifery practice of the country is in the hands of the indigenous dais, who are as a class untrained and illiterate. In most parts of the country the profession is an hereditary one, the older women handing on their practices to their daughters or daughters-in-law. They are mostly low caste and of uncleanly habits, which is consistent with the Hindu belief that labour is an uncleanly affair. Like most Indian women they wear numerous silver rings and silver or glass bangles which are not removed while at work. Experiment has shown that from the rings especially abundant colonies of staphylococci can be grown. Their clothes are seldom washed, and although they remove most of their clothes when conducting a case of labour, their persons are equally filthy. When a woman begins to suffer from the symptoms of puerperal sepsis her dai examines her, and inserts some plugs of filth in the vagina. If relief does not speedily follow other dais are called in, all examine, cleanse their hands perfunctorily, and go away to attend normal cases. It is not surprising that on occasion 80 per cent. of the labour cases in a town have been attacked with puerperal sepsis.

### *Some Unsolved Problems.*

It would not appear necessary to look further than the streptococci on the fingers of the dai for the causes of the puerperal sepsis, and yet, though the customs of the dai are the same throughout India, rumour has it that some parts of the country are more seriously affected than others in this respect. Taken in conjunction with the fact that in England immunity from puerperal sepsis has not followed the introduction of antiseptics, this local incidence would seem to show the need for careful investigation. There is also a popular and widespread impression in India that tetanus is a common affection of new-born infants, due to infection at the time of cutting the cord. Another popular impression is that ophthalmia neonatorum is a great scourge. Experience of those with large midwifery practices seems to show that at least in many parts of the country ophthalmia neonatorum is rare, and that the frequent cases of child blindness met with are due to non-gonorrheal ophthalmia.

During the last 30 years there has been some improvement in the maternity conditions in India due to the increase of women doctors, of women's hospitals and trained midwives, and in some parts to measures for the teaching and supervision of country dais. Formerly, extreme cases of osteomalacia or mal-presentations came in the last stages of labour when the child was so tightly impacted that craniotomy was the only resource, and even then the mother frequently died. Now, in long-established hospitals, such cases are rare. The cases come early or even during pregnancy, and Cæsarean sections and other obstetrical operations produce the best results. This, of course, is only in the few places where women's hospitals and qualified women doctors are to be found.

The immense majority of Indian women object to the attendance of men at their confinements or to any advice from men other than what may be obtained through the medium of the husband. This prejudice is less marked in the South of India and in the large Presidency towns, where a fair number of women enter the maternity hospitals under medical men. This, however, only affects a very small moiety of the women of India. Indian medical men over the greater part of India have no midwifery practice, or rather are only consulted through third parties and occasionally called in as a last desperate resort to effect a forced delivery.

### *The Difficulties of Practical Training.*

This matter has recently attracted public attention owing to the demand of the General Medical Council that the Indian universities should give a better practical training in midwifery if the recognition of their medical degrees is to continue. The medical colleges have not in the past been indifferent to the question and have probably done their best to get midwifery cases for teaching purposes. But they are working against a great national prejudice, and one which the women at least can see no good cause to alter. The women are satisfied with their dais. If they want anything more there is the trained midwife and the woman doctor. Why, they ask, should they leave home to go to a hospital?

The teaching in midwifery in the medical colleges and schools is almost entirely bookwork. In most of the colleges students witness six cases of labour, four students being put on a case. The student has no opportunity of seeing cases delivered in the peoples' homes. This, of course, is due to the scarcity of clinical material in the maternity hospitals where large numbers of students attend. Each university town has also hospitals staffed by women doctors where clinical material is abundant, but, unfortunately, the hospitals are not recognised for teaching, with the result that Indian and Anglo-Indian medical women pass out of their colleges as badly equipped as do men as regards obstetrics. The state of qualified practice, with a few exceptions, is lamentable. Indeed, it can scarcely be otherwise when medical men and women who have had no practical experience of obstetrics are called to neglected cases with severe complications.

They are likely to feel that careful aseptic precautions are a waste of time, and they have not gained by constant practice that aseptic sense which makes it impossible for a good obstetrician to use a towel picked off the floor or examine without disinfecting his hands. Women sub-assistant surgeons who have been trained in the best medical schools in India frequently attend cases without taking any bag or outfit and without using antiseptics. If an antiseptic lotion is used it is generally made from a dirty packet of permanganate of potash crystals, so weak as to be useless. Trained midwives are a few degrees worse; some carry no bags, others bags which can only be described as filthy.

### *The Training of Midwives.*

There is no recognised standard for midwives training in India. Recently most of the Provinces have started State Medical Boards which hold examinations for midwives. This is a step forward, but it will not be productive of much good until measures are taken for inspecting the work of the passed and registered midwives, and punishing such as deliberately refrain from carrying out instructions given. Trained midwives frequently have stipends from municipalities, but although I have seen much of their work I have not so far come across one midwife who has been given rules to be followed in

her practice, or one place where efforts have been made to see that she makes some attempt to carry out her duties.

The Victoria Memorial Scholarships Fund was founded 18 years ago with the object of improving the indigenous dai class. With an income of little over £2000 a year it has done something in an experimental way, and has for some years past concentrated all efforts on public propaganda and the endeavour to secure the registration and supervision of the indigenous dai. But it should be recognised that a small charitable association with insufficient funds, until recently under lay control, cannot carry out the gigantic task of reorganising the midwifery practice of a country like India. The great obstacle to modern progress is ignorance on the part of the people, and this the Government, with its newly reformed Public Health Department, is now in a position to combat. But, since men are in almost all cases debarred from attending labour cases and penetrating into the zenanas, a medical woman should be appointed to assist the Commissioner for Public Health, and to organise measures for coördinating existing agencies and forming public opinion throughout the country. The need for medical women to advise on measures for improved conditions of childbirth and infancy has been recognised in England, and it is still greater in India.

Future historians may well blame us for the small relief which we have given to the physical ills of Indian women. For the past hundred years the conditions I have described have been known to Government officers. But no effort has been made to relieve them. The Dufferin Fund, founded by a Viceroy's wife in 1886, was a purely charitable organisation; the Victoria Memorial Scholarships Fund was the same. Both were entirely inadequate to the need. In 1914 the Government of India commenced an annual grant of £10,000, since increased to £25,000, to carry on a Women's Medical Service, and in 1916 it gave a grant of £7000, since increased to £14,000, to support a medical college for women at Delhi. Both these grants are far less than is required. Most Provincial Governments give small doles to hospitals staffed by women in their Provinces, but in every case the grants are too small, and the hospitals all lead a struggling and precarious existence.

The infantile mortality taken over the whole country in 1919 was 270 per 1000. The Commissioner for Public Health in his last report stated that in Bengal 70 per cent. of this mortality occurs in the first month of life, and two-thirds of that again in the first week, showing the urgent need for improving the maternity conditions. In spite of these facts, not a single medical woman is employed by the Government of India in the Medical or Public Health Departments. Out of all the Provincial Governments only one (the Punjab) employs a woman in the Medical or Public Health Department.

*Conclusion.*

These remarks are not made with any critical intention, but with the desire to draw pointed attention to a great need. Already in the Legislative Councils of the Provinces questions are being asked as to the Government's intentions with regard to the conditions of childbirth. Surely it would be best that reform should come from above as the work of an expert appointed by Government for the task, rather than be forced out of Government by the uninstructed Legislative Councils, who are not aware what should be done, but only conscious of the acute need of their women and children, and of the suffering which they know in other countries is being relieved.

HARVEIAN SOCIETY.—The annual dinner will take place on Thursday, June 15th, at the Café Royal, Regent-street, London, at 7.30 P.M. Sir William Willcox, the President, will preside.

## ROYAL INSTITUTE OF PUBLIC HEALTH: CONGRESS IN PLYMOUTH.

THE Congress of the Royal Institute of Public Health opened with an inaugural meeting in the Guildhall at Plymouth on May 31st. The scene was as brilliant as the weather, the uniforms of the military and naval authorities combining with the robes of the delegates to form a striking display. The international character of the Congress was emphasised by the presence of delegates from all parts of the world.

The delegates were welcomed by the Mayor of Plymouth (Mr. J. F. Winnicott), who expressed the hope that the deliberations of the Congress would be of direct benefit to the town, which was endeavouring to effect a unification of its various health services.

Sir WILLIAM SMITH, vice-president and principal of the Royal Institute, presided in the absence of the president, Lord Leverhulme, who was unavoidably detained in America, and inducted the president for the year, the Earl Fortescue, Lord Lieutenant of the county of Devon.

*The Presidential Address.*

Lord FORTESCUE, in his presidential address, recalled the fact that the Institute had not met in Devon since their meeting at Exeter 20 years ago. He referred to the awakened interest in public health and made a passing reference to the former health programme of Disraeli and his mot, that for the English people not "vanitas vanitatum," but "sanitas sanitatum, omnia sanitas," should be its watchword. He drew attention to the war-time recruiting figures to emphasise the dangers of national deterioration in physique, and of the need for healthy citizens, especially in relation to the dearth of population in the great empty spaces of our Empire and the dangers to the Empire consequent thereon. The maternity and child welfare work and county nursing associations he considered of special importance as agencies not only for the prevention of disease but for bringing to the very homes of the people the elementary rules of health and the necessity for attention to them. It was their aim to put a certified midwife and a competent nurse within the reach of every family. Financial stringency was the cause of delay in the provision of houses, but at the first opportunity more ought to be done in this direction, since a shortage of houses was the basis of many of the present problems of public health. If those engaged in public health work were able to reduce the number of individuals of the C3 class, the people of this country would be better fitted for the responsibilities of our Empire.

*Delegates Addresses.*

Delegates from various nations then gave short addresses, the company standing while the National Anthem of each delegate was played. Prof. CRUCHET, vice-president of the municipality of Paris, speaking in French, indicated the close relation between science and administration on matters of public health. He spoke of the cordial relations between the two countries during the war in matters affecting the health of the two nations. Dr. KING, of the American public health service, stated that America no longer held a position of isolation in public health matters, but was vitally interested in European conditions.

The Congress was welcomed to Plymouth by Surgeon Rear-Admiral MCNABB, who pointed out the special problems relating to public health from the point of view of the services.

Colonel SOLTAU, one of the organising secretaries, detailed an attractive list of recreations and visits to places of interest which had been organised for the benefit of members of the Congress. The proceedings then ended with the National Anthem.

### THE PROGRAMME OF THE CONGRESS.

The work of the Congress has been divided into four sections. 1. State Medicine and Municipal Hygiene. 2. Naval, Military, and Air. 3. Bacteriology and Biochemistry. 4. Women and Public Health.

An interesting and important series of papers and discussions commenced at 9.30 A.M. on Thursday in the various sections and continued on Friday and the Monday following, Saturday being devoted to various excursions to places of interest in the neighbourhood.

On Thursday evening, June 1st, the Mayor and Corporation of Plymouth held a reception in the Guildhall, at which a large number of people, both delegates to the Congress and local residents, attended. A most enjoyable evening was spent.

#### *The Care of the Expectant Mother.*

A suggestive paper in Section IV. by Prof. LOUISE MCILROY on the Expectant Mother showed the subject of obstetrics to be merging into the domain of preventive medicine, the care of the pregnant woman being the responsibility of the State rather than that of the voluntary institutions. More investigation of reproduction and child welfare from the normal standpoint as well as from the abnormal and pathological should be undertaken. At present the whole system of the teaching and treatment in obstetrics was one of chaos and until the whole subject came under complete State control progress would be retarded. Maternity and child welfare was the most important piece of work a nation could undertake. Prof. McIlroy suggested that an efficient supervision of cases of pregnancy would diminish to a great extent much of the present surgical procedure necessary at childbirth. Puerperal septicæmia had not appreciably diminished recently. It was more by the supervision of the patient during pregnancy and avoidance of operative interference than by preventive aseptic methods that improvement will be effected. Children born without the aid of operative measures have a much better chance of life than those who have undergone severe delivery by forceps. It is the viability of the child that matters, not its merely remaining alive for a few days while under the obstetrician's care. She advocated compulsory notifications of all terminations of pregnancy. Until then we cannot make any positive statements about the death-rate before birth. Investigation of diseases such as toxæmia will lead to beneficial results, just as in the case of syphilis. Ante-natal care will reduce the number of blind and feeble-minded and unfit who require life-long institutional accommodation. Failure in breast-feeding can be prevented by attention during pregnancy to teeth and digestive organs.

Prof. McIlroy suggested as an ideal maternity scheme: 1. The hospital as a centre for treatment, teaching, and research, containing (*a*) in-patient department, with lying-in-wards, and ante-natal beds for observation. Isolation beds for cases of sepsis and obstetric wards for V.D. cases. (*b*) Out-patient department, with ante-natal consultation and post-natal, dental, and V.D. clinics. 2. Infant welfare and treatment. 3. Laboratory for biochemical examinations of urine, blood, &c. Auxiliary aid could be utilised by incorporating the accommodation in hostels and rest homes for expectant and nursing mothers, convalescent homes, home visiting, and registration of patients in attendance. The inspection of pregnant women in industries would lead to a modification of the work, rest hours, and the safeguarding of the mother's interests as a whole. We must raise the status of the expectant mother and make childbearing easier for married women who frequently get forgotten in our endeavour to be charitable and generous to the unmarried mother. Compulsory notification of pregnancy was unimportant. Pregnant women will notify their condition to the medical authority when they become convinced of the great advantage of doing so. With regard to midwives their training lacks the study of ante-natal conditions. They should have facilities for sending cases to be seen by specialists when necessary.

An interesting discussion followed. The chief points emphasised were the need for coördination of services, the necessity of the higher training of midwives, and the education in health matters of mothers and girls in school.

## MEDICINE AND THE LAW.

### DYING DECLARATIONS.

THE law with regard to dying declarations appears to be the same in Canada as in this country, and a well-known Canadian judge, Mr. Justice Riddell, in drawing up a practical guide for persons, not lawyers, who may have to receive the confidences of a dying man, has covered useful ground. Save, perhaps, to ministers of religion, such declarations are more often made to doctors than to any section of the public, though nurses receive, on occasion, in this way confidences of the first importance to justice. A dying declaration is not to be confused with a dying deposition. A deposition is a formal document drawn up by or in the presence of a magistrate where it is believed that the deponent is not likely to recover, and the formalities to be observed with regard to it are the concern of the magistrate who takes down the statement. Here it is provided that if the person against whom the deposition is to be used is not present, so as to have the opportunity of cross-examining the deponent, it must be proved that he had notice that the deposition would be taken, and that he could have been present had he so chosen. The deposition can be used whatever the charge; the declaration only against a person who may be charged with causing the death of the declarer. The declaration is not made on oath or affirmation, as is the deposition, but is received as the words of a dying man, uttered at a time when, in the language of one of our judges, "every motive to falsehood is silenced and the mind is induced by the most powerful consideration to speak the truth."

It is the duty of every good citizen to disclose crime and to preserve evidence of it. A medical man, therefore, attending a patient who is likely to die in circumstances indicating that the death may be caused directly or indirectly by act of omission or commission, should endeavour to obtain such evidence from the dying man as is available. This is not, as it is sometimes offensively put, to act the part of a detective, but rather it is to act the part of a good citizen, and it is called for only in cases where foul play is reasonably suspected. It must be remembered also that the dying declaration may be as useful to protect the innocent accused of crime as to convict the guilty.

Such is Mr. Justice Riddell's reasonable statement of the ethics of the case; it is made from a layman's standpoint, rather than from that of a medical man. The medical man's time and cares have a prior claim upon them. His first duty must be directed to saving life; failing that he must strive to relieve avoidable pain. The endeavours to extract evidence from the patient, which now may follow, will be modified according to the medical man's conscience and his judgment. There certainly can be no wish in the mind of any medical man who sees a man or woman dying before his eyes from a cruel crime to see the criminal escape detection. As far as he can reasonably do so, his duty and his inclination must be to aid justice like any other citizen. It may be that in so doing he will help to save the lives of other potential victims. We need only refer to cases of criminal abortion or of poisoning in order to suggest examples of this. Mr. Justice Riddell says: "Speaking generally, it is always wise for the doctor as soon as he thinks that a case is hopeless, to inform the patient of the fact—he may have affairs to settle, a will to make, directions to give, &c." Difficulties may sometimes arise as to which it is impossible to lay down any fixed rule—for example, the patient may be of such a temperament that a statement of this

kind would probably cause death sooner than it would otherwise occur, a situation which must be left for the medical man to deal with, relying upon his own sense and discretion in accordance with the facts of the particular case—a case of a class that will not often occur.

With regard to the law, it is important to remember that the statement made by the dying man will only be admissible as evidence if it can be proved to have been made "with a settled hopeless expectation of imminent death." The judge must be satisfied that the deceased was conscious of his being in a dying state at the time of making the statement. "Imminent death" does not mean that he expected to die that day, or did, in fact, do so; but is to be construed reasonably. The question is what was in the mind of the deceased. The decisions appear to leave it in some doubt whether this can be inferred from the serious condition of the patient, or from the nature of the wounds, coupled with the inference which the patient might naturally draw from his sensations and his knowledge of his injuries. He should, in fact, be warned of his state, and make an admission that he is conscious of it if the matter is to be perfectly regular and beyond question. A statement has been excluded made by a man who when he made it said that he had "no hope at present" that he would recover. The statement may be elicited by questions. It is best that it should be taken down in writing at the time, and if the dying man is able to sign it is best that he should do so, and that any witnesses should do so as well. This is not, however, necessary.

The law looks jealously at every point concerning the admissibility of evidence in all criminal cases. But the question of admitting evidence is for the judge to decide. The person who obtains or hears the statement, and who may be (but is not necessarily) a medical man will have done his duty if to the best of his ability he has been perfectly fair and accurate.

# Public Health Services.

## MUNICIPAL HEALTH DEPARTMENT PRACTICE IN U.S.A.

THE first report of the committee on municipal health department practice of the American Public Health Association, to which we have already drawn attention,[1] has now been published in pamphlet form, and contains much information of interest to all who are concerned in British administration. The position of health officer (who corresponds to our M.O.H., except that he is in a few instances not medically qualified, and has no special diploma in public health), as regards qualifications, tenure of office, and salary, is set out clearly, and is seen to be subject to considerable local variation. In 28 out of 75 cities he is appointed by the mayor, in 24 cities by the special Board of Health. In 64 he possesses a medical degree, and in only four the degree of doctor of public health. In 13 cities his position is protected by civil service conditions; in 40 cities he holds office merely from one to five years, while in 27 the tenure is of indefinite duration. The health officer is engaged also in private practice in one city with a population over half a million, in one city of a second group (250,000 to 500,000 population), and in 21 cities with a population under 250,000. The salaries given are extremely low as compared with salaries in this country. In the largest cities with over half a million population the range of salary is from $2200 for a part-time health officer to $10,000 for a full-time officer. In cities having a population of one half to one quarter of a million the range of salary is from $4000 in three cities to $6500 in one city; and in cities with a population of less than a quarter of a million the range of salary is from $1200 to $6000 usually for part-time service. Out of a total of 78 cities in only six is the salary $7500 or over, and in 17 between $5000 and $7000.

[1] THE LANCET, May 6th, p. 905.

*Expenditure on Health Service.*—In 79 cities the gross expenditure for all purposes of health ranged from 21·6 cents to $3·18 per head, the mean being approximately a dollar. In 72 cities 82 per cent. of the health department expenditure was on salaries. Of the gross expenditure about 54 per cent. was on health service proper; 35 per cent. on hospital service, including general and isolation hospitals; 8 per cent. on garbage and refuse removal; and 3 per cent. on miscellaneous services. For strictly defined health services, excluding hospitals for infectious diseases, 79 cities spent on an annual average 52·4 cents per head. For 72 cities it was possible to distribute this expenditure according to the kind of work performed; and perhaps the chief interest of this report consists in this apportionment of expenditure. In these cities, of the total health department expenditure 11·1 per cent. was on administration, 15·2 per cent. on control of communicable diseases, 3·1 per cent. on tuberculosis, 2·5 per cent. on venereal disease, 7·5 per cent. on infant welfare, 9·8 per cent. on school hygiene, 3·3 per cent. on public health nursing, 6·9 per cent. on laboratories, 14·0 per cent. on food inspection, 19·0 per cent. on sanitary inspection, 3·1 per cent. on vital statistics, and 4·5 per cent. miscellaneous.

*Hospitalisation.*—In 36 cities it was found that 54 per cent. of small-pox cases, 42 per cent. of typhoid fever cases, 23 per cent. of scarlet fever and of diphtheria cases, and smaller proportion of most other infectious diseases were treated in hospitals.

*Placarding.*—It appears to be an almost universal practice to placard the house or the apartment for small-pox, diphtheria, or scarlet fever; the same practice being adopted largely also for other infectious diseases. For the varying practice as to periods of isolation, terminal disinfection, and control of contacts, reference may be made to the report.

*Tuberculosis.*—The reporting of cases of this disease is stated to be still very lax, but there are exceptions to this; the proportion of notified cases to death in several areas exceeding 4 to 1. The provision for all cases of tuberculosis in 59 cities was about one bed for every 1·9 deaths. In other branches of anti-tuberculosis activities evidently the quality and quantity of the work varied greatly.

*Venereal Diseases.*—In 1920, in 62 cities, with a population of some 23 millions, 61,758 cases of syphilis and 58,074 of gonorrhœa were notified, giving an apparent incidence-rate of 270 and 253 per 100,000 respectively. The details of administrative work are too scanty to bear summarising.

*Infant Hygiene* work is general. There were pre-natal clinics in 67 and infant welfare stations in 77 cities. In 52 cities there was on the average one welfare physician for each 689 infants registered at the station, and one welfare nurse for each 313 infants.

*School Medical Inspection.*—The number of pupils per full-time medical inspector is usually about 10,000, varying from 3000 in Pittsburgh to 19,000 in Omaha.

*Public Health Nurses.*—Grouping together all official and non-official agencies there is an average of 16·5 public health nurses per 100,000 population in 80 cities. In 19 cities this work is generalised, and in 55 it is specialised. In the cities in which it is specialised it was found that 2·7 nurses per 100,000 population were available for tuberculosis work, 4·2 for school nursing, 3·1 for infant hygiene, and 7·5 for general nursing services.

*Publicity and Public Health Education.*—In eight cities there is a special publicity director, and in 22 cities there is a definite appropriation for this work. The activities under this heading embrace the issue of bulletins, press stories, lectures, and training of personnel.

In the preceding paragraphs only a brief summary of some of the more important findings of this committee has been given. The details of the report are well worth examination by all students of public health administration. Further reports are promised, wherein, "by selecting the best procedures in each line of work actually carried out in a given city, and by combining the highest attainments of each of the 83 cities which coöperated in this study," a practical ideal may be presented for the guidance of the guardians of the public health.

FRENCH LEAGUE AGAINST INFANTILE MORTALITY.—An international congress on maternal and infant protection is to meet in Paris from July 6th–8th under the auspices of the Ligue contre la Mortalité Infantile (49, rue de Miromesnil, Paris) of which the president is Dr. Paul Strauss. The congress will be held in four sections, dealing respectively with ante-natal protection, care of the nursing mother, care of the infant separated from its mother, assistance and instruction. Representatives are invited from bodies with similar aims in other countries. Information can be obtained from the secretary-general at the address of the League.

# BRITISH MEDICAL ASSOCIATION: ANNUAL MEETING.

THE ninetieth annual meeting of the British Medical Association will be held at Glasgow from July 25th–28th, under the presidency of Sir William Macewen. The last meeting held there was in 1888, when the late Sir William Gairdner presided. The annual meeting will be preceded by the annual meeting of the Representative Body which opens at 10 A.M. on Friday, July 21st, in the Bute Hall of the University, with Dr. R. Wallace Henry in the chair, the representatives dining together on that evening. The statutory annual general meeting takes place at 2 P.M. on Tuesday, July 25th, and will be adjourned until 8 P.M., when the overseas delegates and foreign guests will be received and the President will deliver his address. The annual dinner of the Association is appointed for 7 P.M. Thursday, July 27th, in St. Andrew's Hall. Prof. Graham Kerr will give the popular lecture at 7.30 P.M. on Friday, July 28th, taking as his subject, the Physician—Naturalist, Teacher, Benefactor. An exhibition of surgical instruments, drugs, foods, &c., will be on view in the Kelvin Hall from July 25th to 28th.

The scientific part of the meeting will divide as usual into a number of sections, meeting from 10 A.M. to 1 P.M. on Wednesday, Thursday, and Friday, July 26th–28th. Laboratory and clinical demonstrations in connexion with the work of the sections will be given in the afternoons of the same days. The director of demonstrations is Mr. R. H. Parry, 25, Blythswood-square, Glasgow.

The following sections meet on three days—Wednesday, Thursday, and Friday, July 26th, 27th, and 28th.

### *Medicine.*

President: Prof. Thomas Kirkpatrick Monro. Vice-Presidents: Dr. John M. Cowan, Sir Archibald E. Garrod, Drs. George Hall, C. O. Hawthorne, John Hay. Hon. Secretaries: Dr. Adam Patrick, 16, Buckingham-terrace, Glasgow; H. Letheby Tidy, 39, Devonshire-place, London, W. 1.

*Provisional Programme.*—July 26th (10 A.M.).—Discussion: The Prognosis and Treatment of Chronic Renal Disease. To be opened by Prof. Hugh Maclean.

July 27th (10 A.M.).—Discussion: Exophthalmic Goitre. To be opened by Prof. George R. Murray (Manchester).

July 28th (10 A.M.).—Discussion: Degenerative Diseases of the Liver. To be opened by Sir Humphry D. Rolleston.

### *Microbiology (including Bacteriology).*

President: Dr. Robert MacNeil Buchanan. Vice-Presidents: Mr. John Anderson, Prof. Hy. Roy Dean, Sir Wm. B. Leishman. Hon. Secretaries: Dr. S. Phillips Bedson, Lister Institute, Chelsea, London, S.W.; Dr. J. L. Brownlie, 28, Hamilton Park-terrace, Glasgow.

*Provisional Programme.*—July 26th, 27th, and 28th.—Discussions: Dr. F. D'Herelle (Pasteur Institute, Paris) and Dr. F. W. Twort: The Bacteriophage (Bacteriolysin); followed by Drs. André Gratia, Ledingham, McLeod, Fleming, and Ellis. Dr. Mervyn H. Gordon: The Bacteriology of Influenza; followed by Drs. McIntosh and Dible. Prof. V. H. Blackman: Some Similarities and Dissimilarities in the Microbiology of Plant and Animal Diseases, with special reference to Immunity and "Virus" Diseases; followed by Drs. E. J. Butler, W. B. Brierley, S. G. Paine, and Mr. J. Ramsbottom. Dr. W. B. Brierley: Mutation of Species; followed by Prof. David Ellis.

Papers: Dr. W. R. Wiseman (Glasgow): *B. aertrycke* as a Cause of Epidemic Poisoning by Milk. Prof. Ellis: The Intimate Structure of the Bacterial Cell. Dr. R. Cecil Robertson: On the Toxin of *B. dysenteriæ* (Shiga). Dr. Andrew Connal (Director, Medical Research Institute, Lagos): The Development of *Loa loa* in Chrysops (with demonstration).

Demonstrations in the Laboratory adjoining the section room: Sir William Leishman: Leishmaniasis: Spirochætosis of Tick Fever. Prof. Graham Kerr and Mr. J. S. Dunkerley: Protozoal Parasites. Dr. R. St. John Brooks: Cultures of Organisms Pathogenic for Man, Animals, and Plants. Prof. Ellis: Iron Bacteria; Sulphur Bacteria; Fossil Iron-Moulds.

### *Neurology and Psychological Medicine.*

President: Prof. George M. Robertson. Vice-Presidents: Drs. A. Stanley Barnes, C. C. Easterbrook, J. H. Macdonald, Sir James Purves Stewart. Hon. Secretaries: Drs. Hidred, Carlill, 146, Harley-street, London, W. 1; D. K. Henderson, 17, Whittinghame Drive, Glasgow.

*Provisional Programme.*—July 26th (10 A.M.).—Discussion: Psychotherapy. To be opened by Dr. T. W. Mitchell, on Psycho-therapeutics and Psycho-pathology; followed by J. A. Hadfield, on the Making of a Neurotic; Dr. Jane Suttie, on Mental Stresses of Adjustment in Women; and by Dr. Crichton Miller, on the Psychic and Endocrine Factors in Functional Disorders.

July 27th (10 A.M.).—Discussion: The Treatment of Neuro-syphilis. To be opened by Sir James Purves Stewart; followed by Dr. Kinnier Wilson, on Observations on the Treatment of Neuro-syphilis; Dr. Douglas K. Adams, on the Treatment of Neuro-syphilis, with Special Reference to the Changes in the Cerebro-spinal Fluid; and Dr. Ernest M. Dunlop, on the Bearing of the Wassermann Reaction on Diagnosis and Control of Treatment of Nervous Syphilis.

July 28th (10 A.M.).—Paper by Dr. J. H. Macdonald on the Elements of Contrast in the Psychic Mechanism.

### *Obstetrics and Gynæcology.*

President: Prof. Ewen J. Maclean. Vice-Presidents: Dr. H. Russell Andrews, Prof. J. M. Munro Kerr, Prof. Louise McIlroy, Dr. E. Farquhar Murray. Hon. Secretaries: Drs. S. J. Cameron, 30, Lynedoch-street, Charing Cross, Glasgow; W. D. Macfarlane, 17, Woodside-crescent, Glasgow; H. G. Taylor, 15, Cavendish-place, London, W. 1.

*Provisional Programme.*—July 26th (morning session).—Discussion: Stillbirths and Neo-natal Deaths. Speakers: Dr. J. W. Ballantyne: Ante-natal, Intra-natal, and Neo-natal Death; Causes, Pathology, and Prevention, with special reference to Ante-natal Death. Dr. Eardley Holland: Intra-natal Death. Prof. A. M. Kennedy and Dr. F. J. Browne: Neo-natal Death. Prof. Louise McIlroy: Ante-natal Death Due to Toxæmia of Pregnancy. Dr. J. N. Cruickshank and Dr. Gilbert Strachan. In the afternoon there will be a demonstration of Prof. A. M. Kennedy's specimens in the museum.

July 27th (morning session).—Papers: Dr. W. Fothergill: Surgical Treatment of Uterine Prolapse. Dr. T. W. Eden: Treatment of Eclampsia. Dr. W. Osborne Greenwood: Anæsthetics and Analgesics in Labour.

July 28th.—Papers: Dr. Robert Knox: Use of Radium and X Rays in Relation to Gynæcology. Dr. John Campbell (Belfast): Treatment of Salpingo-oöphoritis.

### *Ophthalmology.*

President: Mr. A. S. Percival. Vice-Presidents: Dr. A. J. Ballantyne, Sir William T. Lister, Dr. John Rowan. Hon. Secretaries: Dr. Percival J. Hay, 350, Glossop-road, Sheffield; Dr. W. H. Manson, 17, Royal-terrace, Glasgow.

*Provisional Programme.*—July 26th (10 A.M.).—Discussion: The Ætiology of Optic Atrophy. To be opened by Dr. C. O. Hawthorne, Mr. J. Hogarth Pringle, and Dr. H. Moss Traquair.

July 27th (10 A.M.).—Discussion: The Clinical Significance and Treatment of Heterophoria. To be opened by Mr. A. S. Percival and Dr. L. Webster Fox (Philadelphia).

July 28th.—Clinical demonstration at the Glasgow Eye Infirmary.

### *Pathology (Human and Comparative).*

President: Prof. Robert Muir. Vice-Presidents: Dr. J. S. C. Douglas, Prof. John Shaw Dunn, Dr. Archibald Leitch, Prof. John H. Teacher. Hon. Secretaries: Drs. John Anderson, "Westerhill," St. Bride's-road, Newlands, Glasgow; Robert Donaldson, St. George's Hospital, London, S.W. 1.

*Provisional Programme.*—July 26th (10 A.M.).—Discussion: The Origin of Cancer in Relation to Specific Forms of Irritation. To be opened by Prof. Fibiger (Copenhagen).

July 27th (10 A.M.).—Discussion: Animal and Vegetable Pathology in Relation to Human Disease. To be opened by Profs. F. G. Hobday and W. H. Lang.

July 28th (10 A.M.).—Papers.

The Pathological Museum will be housed in the Anatomical and Natural History Departments, in the same block as that in which the Section will meet.

### *Public Health.*

President: Dr. A. K. Chalmers. Vice-Presidents: Drs. R. J. Reece, F. E. Fremantle, Harold Kerr. Hon. Secretaries: Drs. R. S. Fullarton, Sanitary Chambers, Glasgow; J. J. Paterson, The Guildhall, Maidenhead; Richard Paton, Sanitary Chambers, Glasgow.

*Provisional Programme.*—July 26th (10 A.M.).—Papers: Dr. Richard J. Reece: Port Sanitation in Relation to the Public Health of the Country. Dr. F. E. Fremantle: Public Health Economics. Dr. John Brownlee: Statistics. Discussion on Puerperal Fever if time permits.

July 27th.—Papers: Dr. Roberts: Defects in Children on Attaining School Age. Dr. McKail: Industrial Fatigue and Vocational Selection on a Basis of Physical Inquiry. Dr. J. P. Kinloch: The Constituents of Fresh and Vitiated Air, and their Significance in Problems of Ventilation.

Dr. F. E. Wynne (Sheffield): The "Wrong Turning" in Public Health.

July 28th.—Papers: Councillor W. B. Smith: Smoke Abatement. Discussion: The Training for the D.P.H. and the New Regulations. To be opened by Prof. Matthew Hay (Aberdeen). 11.30 A.M., Discussion: The Administrative Requirements for the Various Types of Tuberculosis.

A Public Health Exhibition, organised by the Corporation of Glasgow, will be held in the Kelvin Hall from July 25th to 28th inclusive.

*Surgery.*

President: Prof. H. Alexis Thomson. Vice-Presidents: Mr. James Berry, Sir Kennedy Dalziel, Mr. A. Ernest Maylard, Mr. G. Grey Turner, Mr. R. J. Willan. Hon. Secretaries: Mr. J. A. C. Macewen, 3, Woodside-crescent, Charing Cross, Glasgow; Mr. John Patrick, 9, Newton-place, Glasgow; Mr. H. S. Souttar, 58, Queen Anne-street, London, W.

*Provisional Programme.*—July 26th (10 A.M.).—Discussion: The Diagnosis and Treatment of Cholelithiasis. To be opened by Prof. J. Rutherford Morison, Dr. de Martel (Paris), and Mr. Farquhar Macrae.

July 27th (10 A.M.).—Discussion: Surgical Treatment of Non-traumatic Affections of the Spleen. To be opened by Dr. James Carslaw, Sir Kennedy Dalziel, and Dr. E. H. Kettle. Paper: The Surgery of the Pituitary Gland, by Mr. Walton.

July 28th (10 A.M.).—Discussion: The Surgical Treatment of Non-malignant Affections of the Colon. To be opened by Sir William Arbuthnot Lane, Mr. Waugh, and Sir H. M. W. Gray.

The following sections will meet on two days:—

*Dermatology.*

President: Dr. H. Leslie Roberts. Vice-Presidents: Drs. A. M. H. Gray, G. H. Lancashire, J. G. Tomkinson. Hon. Secretaries: Drs. Wm. Herbert Brown, 20, Park-circus, Glasgow; Haldin Davis, 17, Cavendish-place, London, W. 1.

*Provisional Programme.*—July 26th.—Discussion: Ætiology of Seborrhœa and Seborrhœic Dermatitis. Opening paper by Dr. Cranston Low. The discussion will be opened by Dr. Harold W. Barber.

July 27th.—Discussion: Occupational Dermatitis. Opening paper by Dr. Wm. Jas. O'Donovan. The following short private papers will be introduced: Dr. George Herbert Lancashire: Dermatitis Artefacta. Prof. J. Goodwin Tomkinson: Alopecia Areata and Strabismus, a Family Group of Cases.

Clinical demonstrations will be arranged on both days; the hour probably 9 A.M.

*Diseases of Children.*

President: Sir Herbert F. Waterhouse. Vice-Presidents: Drs. Leonard Findlay, Robert Hutchison, Alex. McLennan, R. H. A. Whitelocke. Hon. Secretaries: Drs. Geoffrey Bourne, 150, Harley-street, London, W. 1; G. B. Fleming, 13, Lynedoch-crescent, Glasgow.

*Provisional Programme.*—July 26th (morning session).—Joint discussion with the Section of Physiology: Ætiology of Rickets. To be opened by Dr. Leonard Findlay and Prof. Mellanby, and followed by Dr. Robert Hutchison and Prof. Noël Paton. Afternoon session.—Clinical Demonstrations at the Royal Hospital for Sick Children (medical and surgical). Mr. Alex. McLennan will give a demonstration on scoliosis. July 27th (morning session).—Discussion: Treatment of Tuberculous Cervical Glands. To be opened by Mr. John Fraser. Afternoon session.—Clinical Demonstrations at the Royal Hospital for Sick Children (medical and surgical). Mr. Alexander Mitchell will show skiagrams of Regeneration of Bone in Osteomyelitis.

*Industrial Diseases and Forensic Medicine.*

President: Prof. John Glaister. Vice-Presidents: Drs. Godfrey Carter, William Ledingham Ruxton, Sir William H. Willcox. Hon. Secretaries: Drs. Andrew Allison, St. Vincent Park, Paisley-road, W. Ibrox, Glasgow; James R. Kerr, The Pilkington Special Hospital, St. Helens, Lancs.

*Provisional Programme.*—July 26th and 27th.—Opening address by Prof. Glaister. Papers: Sir Thomas Oliver: Some Circumstances which make for Industrial Efficiency. Sir W. H. Willcox: Dangers to Health Arising from Use of Preparations of Arsenic in Various Industries. Dr. John Glaister, junr.: New Apparatus for the Assessment of Efficiency after Injuries. Dr. R. A. Lyster: The Importance of Teaching Forensic Medicine to Students of Medicine and Law.

*Physiology.*

President: J. A. MacWilliam. Vice-Presidents: Prof. Edward Mellanby, Prof. D. Noël Paton. Hon. Secretaries: Drs. George Graham, 37, Queen Anne-street, London, W.1; W. F. Shanks, Physiological Institute, University of Glasgow.

*Provisional Programme.*—July 26th (morning session).—Joint meeting with the Section of Diseases of Children: Discussion on Rickets. To be opened by Dr. Leonard Findlay from the clinical side, and Prof. Mellanby from the physiological side. Paper by Dr. J. Sim Wallace: Dental Hypoplasia and Rickets. Afternoon session: Demonstrations in the Physiological Institute.

July 27th (morning session).—Discussion on Basal Metabolism. To be opened by Prof. E. P. Cathcart. Afternoon session: Demonstrations in the Physiological Institute.

*Radiology and Electrology.*

President: Dr. Leonard A. Rowden. Vice-Presidents: Drs. E. P. Cumberbatch, James Robertson Riddell. Hon. Secretaries: Drs. F. Hernaman-Johnson, 66, Harley-street, London, W. 1; D. O. MacGregor, Langside Cottage, Langside, Glasgow.

*Provisional Programme.*—July 26th (10 to 11.30 A.M.).—Discussion: The X Ray Treatment of Deep-seated Cancers, with Special Reference to Erlangen Methods. To be opened by Dr. J. R. Riddell (Glasgow), followed by Dr. Douglas Webster, Dr. Hernaman-Johnson, and Dr. C. W. Saleeby, the last from the point of view of a non-practising medical man. 11.30 A.M. to 12 noon.—Dr. J. A. Longley: Comparison of Coil and High-tension Transformer in X Ray Therapy. 12 to 1 P.M.—Discussion on the Value of Gas Inflation in X Ray Diagnosis. To be opened by Dr. Hernaman-Johnson, followed by Dr. J. Magnus Redding.

July 27th (10.30 A.M.).—Papers: Dr. H. E. Gamlen: A Short Account of the Bucky-Potter Diaphragm and the Lead-Glass Shield for the 7-in. Coolidge Tube. Dr. C. W. S. Saberton: Points in the Differential Diagnosis of Simple and Malignant Bone Disease. Dr. James Crocket: The Differentiation of Active from Quiescent Tuberculosis of the Lung. Dr. E. W. Reed: X Rays in Diseases of the Skin. Dr. J. Gibson Graham: X ray Treatment of Tinea. 11.30 A.M. to 1 P.M.—Discussion on the Therapeutic Value of High-frequency Currents and Static Electricity. To be opened by Dr. Cumberbatch, Dr. F. Howard Humphris, and Dr. W. F. Somerville.

The following sections will meet each on one day.

*Anæsthetics.*

President: Dr. W. J. McCardie. Vice-Presidents: Drs. James Paton Boyd, L. Mabel Renwick Campbell. Hon. Secretaries: Drs. H. Prescot Fairlie, 19, Bute-gardens, Glasgow; Hubert Pinto-Leite, 24, Fellows-road, South Hampstead, London, N.W. 3.

*Provisional Programme.*—July 26th (10 A.M.).—Discussion on Broncho-pulmonary Complications following Operation under Anæsthesia. To be opened by Dr. David Lamb. Offers from those desiring to take part in the discussion should be sent to one of the secretaries. Paper and demonstration by Dr. A. L. Fleming: Different Effects Produced by Exposing Tissues to Various Concentrations of Anæsthetic Vapour. Demonstrations of Anæsthetic Apparatus.

*Anatomy.*

President: Prof. Alexander Macphail. Vice-Presidents: Prof. J. C. Brash, Prof. J. T. Wilson, F.R.S. Hon. Secretaries: Mr. James Battersby, 616, Great Eastern-road, Glasgow; Mr. John Graham, 351, Renfrew-street, Glasgow.

*Provisional Programme.*—July 28th.—Papers: Prof. J. C. Brash: The Relation of the Ureters to the Vagina. Dr. Alfred Piney: The Naked-eye Anatomy of the Bone Marrow with Age Changes. Dr. J. M. Woodburn Morison (Manchester): The Teaching of Anatomy by Radiology, in the Anatomy Department. Dr. W. B. Primrose: The Problem of the Structure of the Vertebrate Head. Dr. W. K. Connell: Observations on the Form of the Palate in Children. Dr. John T. Hunter (Sydney): Intestinal Diverticulum with Retroposition of the Transverse Colon. Discussion: The Administration of the Anatomy Act. To be opened by Dr. Alex Macphail. Demonstration of a series of embryological models by Prof. Thomas H. Bryce, F.R.S.

*Laryngology.*

President: Dr. John Macintyre. Vice-Presidents: Dr. A. Brown Kelly, Sir StClair Thomson. Hon. Secretaries: Drs. F. F. Muecke, 36, Cavendish-square, London, W.; W. S. Syme, 11, Lynedoch-crescent, Glasgow.

*Provisional Programme.*—July 27th.—Discussion: Diseases of the Œsophagus, their Symptomatology and Differential Diagnosis. To be opened by Dr. D. R. Paterson and Mr. W. G. Howarth.

*Medical Sociology.*

President: Dr. E. Rowland Fothergill. Vice-Presidents: Drs. Charles E. S. Flemming, James Hudson, Peter Macdonald. Hon. Secretaries: Drs. Alex. Forbes, Hillsboro' Lodge, Sheffield; David McKail, 2, Morris-place, Monteith-row, Glasgow.

*Provisional Programme.*—July 28th.—Section will meet in the Debating Hall of the University Union. Subject for

discussion: Alcohol as a Beverage, and its Relation to Certain Social Problems. 10 A.M., Action of Alcohol on the Human Economy, by Prof. Mellanby, to be followed by Prof. A. R. Cushny, and the Rev. C. C. Weeks. Alcohol in Relation to the Problems of Mental Disorders, to be opened by Sir Frederick W. Mott and Dr. Thomas W. Salmon (U.S.A.), followed by Dr. C. Hubert Bond and Dr. August Ley (Brussels). 2.15 P.M.—Alcohol and Industrial Efficiency, to be opened by Prof. Edgar L. Collis and Dr. M. Hindhede (Copenhagen), followed by Sir Thomas Oliver and Dr. W. E. Elliot. Alcohol and Infant Mortality, to be opened by Dr. J. W. Ballantyne and Prof. C. R. Stockard (Cornell University, U.S.A.), followed by Drs. C. W. Saleeby, T. N. Kelynack, and Ivens; Prof. Louise McIlroy, and Mrs. Stacey Cleminson. Lay persons specially interested may be present only by invitation, a request for which should be made to one of the Hon. Secretaries.

*Otology.*

President: Dr. Albert Alex. Gray. Vice-Presidents: Drs. J. G. Connal, W. F. Wilson. Hon. Secretaries: Drs. F. J. Cleminson, 32, Harley-street, London, W. 1; J. W. Leitch, 6, Clairmont-gardens, Charing Cross, Glasgow.

*Provisional Programme.*—July 26th.—Discussion: Septic Sinus Thrombosis, its Diagnosis and Treatment. To be opened by Sir William Milligan and Mr. Lionel Colledge. The following members will take part in the discussion: Mr. G. J. Jenkins, Mr. T. B. Layton, Mr. Archer Ryland, and Dr. T. Ritchie Rodger. Papers: Prof. Holger Mygind: Benign Forms of Otogenic Meningitis. Drs. J. S. Fraser and Stephen Young: Is it Worth While to Remove Aural Polypi?

*Tuberculosis.*

President: Prof. Sir Robert Philip. Vice-Presidents: Dr. James Crocket, Prof. S. Lyle Cummins, Dr. Wm. Hy. Dickinson. Hon. Secretaries: Dr. A. Hope Gosse, 75, Harley-street, London, W.; Dr. A. S. M. MacGregor, 488, Clarkston-road, Muirend, Cathcart, Glasgow.

*Provisional Programme.*—July 27th (10 A.M.).—Discussions: (1) The Clinical Differentiation of Pulmonary Tuberculosis from other Respiratory Affections. To be opened by Prof. Rist (Paris); (2) Some Aspects of the Treatment of Surgical Tuberculosis. To be opened by Mr. James Taylor. In the afternoon Dr. Rollier (Leysin) will give a cinematograph demonstration illustrating "The Share of the Sun in the Treatment and Prevention of Tuberculosis." It is hoped also to arrange for a demonstration in the Kelvin Hall of radiographs illustrative of chest conditions.

The hon. local general secretary is Dr. George A. Allan, 22, Sandyford-place, Glasgow, W.

# The Services.

## ROYAL ARMY MEDICAL CORPS.

Lt. (temp. Capt.) L. Handy to be Capt.

Lt. (temp. Capt.) W. Y. Eccott to be placed temp. on the half-pay list on account of ill-health.

Temp. Capt. A. H. Marsh relinquishes his commn. and retains the rank of Capt.

### TERRITORIAL ARMY.

Lt.-Col. H. J. Walker, from 2nd E. Genl. Hosp., to be Lt.-Col.

Maj. H. J. Gorrie relinquishes his commn. and retains the rank of Maj.

Capt. J. M. A. Costello relinquishes his commn. and is granted the rank of Lt.-Col.

Sanitary Companies.—Surg.-Maj. (Bt. Lt.-Col.) R. E. Lauder (late Hampshire R.) to be Maj. (Bt. Lt.-Col.), and to command 7th (S.) San. Co. Capt. H. H. Fowler, from 1st Lond. (City of Lond.) San. Co., to be Captain.

The King has approved of the following appointments: Col. G. H. Edington to be Honorary Physician, and Col. A. D. Sharp, C.B., C.M.G., and Col. J. Clay, C.B.E. to be Honorary Surgeons to His Majesty.

Lt.-Col. J. W. West, C.M.G., R.A.M.C., has been appointed Hon. Surg. to the King, and is granted the Bt. rank of Col., vice Maj.-Gen. Sir M. P. C. Holt, K.C.B., K.C.M.G., D.S.O. (retd.).

## INDIAN MEDICAL SERVICE.

To be Lt.-Cols.:—Majs. J. H. Murray, F. P. Mackie, F. P. Connor (Bt. Lt.-Col.), S. R. Christophers, H. Emslie-Smith, H. R. Dutton, H. M. Brown, H. G. S. Webb, W. W. Jeudwine, T. C. McC. Young, W. J. Collinson, C. L. Dunn, H. M. H. Melhuish (Bt. Lt.-Col.), R. D. Saigol, C. E. Bulteel, J. L. Lunham (Bt. Lt.-Col.), and F. C. Rogers.

# Correspondence.

"Audi alteram partem."

## A STANDARD TEXT-BOOK OF SURGERY FOR EXAMINATION PURPOSES.

*To the Editor of* THE LANCET.

SIR,—Prof. C. A. Morton's plea, made in your issue of May 27th, for a standard text-book of surgery for examination purposes is based upon the fundamental fallacy that the student should be encouraged to prepare for examination by reading a text-book, and that the accuracy with which he recites the contents thereof is the test of his knowledge. Such a position is opposed to all the canons of sound medical education. That the text-book has a place in the education of the student I am free to admit, but it must ever be subsidiary and ancillary to personal study and observation carried out in the class-room, the laboratory, and the hospital ward, under the guidance of competent teachers.

Prof. Morton asks for "one recognised text-book of surgery" which he suggests should be prepared by a committee, the statements in which "should for examination purposes be looked upon as authoritative." It is true he does not seek to "limit in any way the teaching of individual views by surgeons which might be accepted by students in preference to any views expressed in the standard text-books, but for examination purposes they would be expected to know what was the generally accepted view." Now surgery not being an exact science, there are many surgical questions on which there is no "generally accepted view," and the attempt to set up a conventional one for "examination purposes" is only calculated to distort the student's outlook. Examinations after all are only a means to an end, and the less prominently the "examination point of view" bulks in the mind of the student the more surely will he study to acquire *knowledge* in preference to *information*.

The testing of the student's knowledge is the business of the examiner, and this will not be made easier if the candidate, believing one thing, states the opposite because some committee has decreed it, and because the examiner is bound to accept it whether he agrees with it or not. It would be unreasonable to expect student-candidates to be familiar with all the conflicting evidence on controversial subjects, but examiners ought to be, and if the answer forthcoming has the support of reason and is backed by authority it should be accepted, whatever may be the examiner's personal opinion.

I am not concerned to discuss the apparent discrepancies in certain statements quoted by Prof. Morton from different text-books; they merely reveal the divergence of opinion that exists on certain points and which no patched-up compromise by a committee will ever remove. Time and added experience and observation may reconcile them, as Prof. Morton might have observed had he used the latest (1921) edition of the "Manual"—for which, with Prof. Alexis Thomson, I am responsible—for his comparisons in place of that dated 1915.

I am, Sir, yours faithfully,

Edinburgh, May 31st, 1922. ALEXANDER MILES.

*To the Editor of* THE LANCET.

SIR,—Prof. Charles Morton's proposal (THE LANCET, May 27th) must have interested many readers, and it may be admitted that a standard text-book in surgery, free alike from all errors and important omissions, would be an excellent thing. It is suggested that such a book should be written by a selected author, revised by a committee, given the hall-mark of the Conjoint Board, and finally admitted as an infallible authority by the examiners. Obviously such a plan could hardly be limited to surgery alone, similar text-books would have to be issued dealing

with medicine, diseases of women, and other subjects controlled by the Board.

Such text-books would naturally drive other competitors off the market, every student would regard them as indispensable for his success. What would be the feelings of all the publishers and authors of our very numerous text-books towards such privileged competitors? Criticism from such sources would not be lacking in bitterness, and could hardly fail to be effective seeing that the new text-books must claim to be both accurate and comprehensive from the first page to the last. To consider surgery alone, as Prof. Morton does, the difficulty of producing an infallible text-book would be enormous. If it has taken 50 years to debate the question of the proper site for the London University (and apparently it will take another 50 to reach a decision), how many years must elapse before a committee of leading surgeons can reach unanimity on all the controversial points in the wide field of surgery?

We may picture such a committee composed of delegates from the Universities of Bristol, Leeds, Edinburgh, Glasgow, and London (Dublin had better be omitted). Suppose them to be drawing up the section dealing with either of the following topics: (1) the details of treatment in syphilis; (2) the best suture-material to be used in abdominal operations; (3) the real value of tuberculin and of iodoform emulsion in surgical therapeutics (B.I.P. may be allowed to R.I.P.) These three subjects are mentioned only because they constantly arise in practice, and therefore, some consensus of opinion on them may be expected to have been reached. It is hardly doubtful that Prof. Morton would find as many different views on these topics as there are members of his committee.

There are probably too many text-books of surgery already, and in the nature of things it is impossible for them to avoid contradicting each other here and there. Important omissions and errors are sure to be found in all, although on the whole their excellence may do great credit to their compilers. It is, however, surprising to find author after author expressing doubt or erroneous opinions on questions settled long ago. Two of such matters referred to by Prof. Morton happen to be of direct personal interest to me—namely, the "Character of Myeloma" and "Backward Dislocation of the Thumb and its Treatment." Messrs. Gask and Wilson's text-book and Sir A. Bowlby's Pathology are quoted amongst others to the effect that *myeloma never gives rise to secondary growths*. Yet 40 years ago in his fine work "Illustrations of Clinical Surgery" (which one would have thought no text-book writer could afford to ignore), my father published a coloured illustration of myeloma deposit in a lymphatic gland secondary to a myeloid epulis, thus settling the question once and for all. Prof. Morton quotes correct teaching from Thompson and Miles's text-books on the subject of dislocation of the first phalanx of the thumb, though, as with much text-book matter, it is far from being adequately treated. From another work (Messrs. G. and W.'s blushes may perhaps be spared a second time), some very faulty writing on the subject is pilloried.

In 1898[1] I published a paper with illustrations proving that the difficulties of reduction in this dislocation lay in the glenoid ligament with its two sesamoid bones *always* going back behind the broad metacarpal head, and how, if necessary, it is easy to obtain reduction by subcutaneous incision of the ligament between the sesamoids, cutting from the dorsal aspect towards the phalanx. The sesamoids then diverge and the bone returns to its place between them. In a later paper[2] I also demonstrated that the same pathology and treatment exactly applied to the great toe, where this dislocation occurs, though much more rarely than is the case with the thumb. This small contribution has, I believe, been ignored by every single text-book writer, English and foreign. In the first-named paper I apologised for going in part over ground previously traversed by Prof. Farabeuf, Mr. W. H. Battle, and others. But recent experience at the Examination Hall has convinced me that the teaching on this subject in text-books and elsewhere must be very deficient, or else the candidates would surely have clearer ideas about it.

[1] Brit. Med. Jour., Jan. 15th.
[2] Med. Chir. Trans.

Reverting to the more general question whether Prof. Morton's proposal is a practicable one, it will be obvious that any standard text-books must require frequent revision and reissue to bring them up to date. The late Sir William Osler's Principles and Practice of Medicine is universally admitted to be an almost perfect book of its kind. Yet recent work has rendered obsolete many of its statements, such for example as those on the treatment of bilharziosis. Sir William Osler's "Medicine" would, I imagine, be considered too large for purposes of an ordinary Pass examination, yet a smaller and better text-book it would indeed be difficult to compile.

Supposing that the difficulties of carrying out Prof. Morton's plan were overcome, that text-books were brought out so accurate and so thorough that the Council or Conjoint Board could fairly say, "Our examiners will accept every statement and view contained in these standard works, and no candidate will be expected to know more than the information they contain," would it prove of real benefit either to the candidates or the examiners? Remember that the examiners themselves have had nothing to do with the preparation of the books, that their duties are very onerous as it is, and that it would be essential for them to be familiar with the whole of the standard text-book in their subject. Many drawbacks occur to one, chiefly that it would render the examination less practical, it would fetter the examiner to some extent, and would lead the candidate to rely almost entirely on book-work. That this is an evil difficult to avoid under modern conditions may be granted, but it is the constant aim of all good examiners to counteract it.

Speaking from many years' experience of surgical examinations at Lincoln's Inn and elsewhere, I may here venture to express my profound respect for the fairness with which they are conducted, and the remarkable accuracy of the results. Now and then a mistaken estimate of a man's knowledge may be formed, but the system at the Royal College of Surgeons that every candidate comes under the view of all the examiners independently is an invaluable one in guarding against this occurrence. It is to me incredible that a candidate should come to utter grief through expressing some view derived from any particular text-book. With a good deal of sympathy for Prof. Morton's interesting proposal, I do not regard it as a practical one, nor do I think if it could be carried out that its advantages would outweigh its drawbacks.

I am, Sir, yours faithfully,

J. HUTCHINSON,
Examiner in Surgery at the University of Glasgow, late Examiner to the Royal College of Surgeons, &c.

June 5th, 1922.

## FIRST REPORT OF THE MINERS' NYSTAGMUS COMMITTEE.

*To the Editor of* THE LANCET.

SIR,—Those who have had practical experience of this disease may be as dissatisfied as I am with the general tenour of the first report of the Miners' Nystagmus Committee. The evidence given for the decisions is extraordinarily inconclusive.

It is the fashion for the moment to attribute the disease wholly to the deficiency of light. How, then, do they account for Snell's case of the disease in a ceiling paperer? I have had one or two cases where there was no deficiency of light. Such cases are simply not mentioned. On p. 29 we are told that "there does not appear to be any definite connexion

between the thickness of the seams and the incidence rate." In support of this statement, which is in direct opposition to Snell's painstaking work on the subject, they give their Table VII., "showing thickness of seam in which 1613 coal-face men worked." However, on looking at the table we find that the number of cases of *nystagmus* is 1613, and that only one case of nystagmus occurred where the thickness of the seam was less than 2 feet, while 650 cases were found where the thickness of seam was 6 feet and over. Such a table is absolutely useless, unless the number of men employed at each thickness of seam is given. Obviously more men are employed in the thick seams than in those less than 2 feet. There might be only two men employed in the seam less than 2 feet, and 40,000 in the seams 6 feet and over.

On p. 40 a curious example of reasoning is quoted: "If lights amounting to 100 candle-power are placed in a room having walls, floor, and ceiling of a reflecting power of 80 per cent., one-fifth of the light will be absorbed and four-fifths reflected. This reflected light is for all intents and purposes a new light of 80 candle-power. .... The total effective light in the room is therefore the same as if the walls and ceiling had been black, and 400 lamps of 1 candle-power each had been spread evenly over the walls, in addition to the original 100 candle-power."

But it is to the amazing neglect of first physiological principles that I wish to call attention. The miner cares not in the least for the total effective light in the pit; what he does care about is the light on the coal-face that he is hewing. Everyone knows that in a fairly dark room contrast of illumination is of supreme importance; one will see an object illumined by a ½ foot candle when the rest of the room is lighted by a 1/10 foot candle far better than if the whole room has an illumination of ½ foot candle.

I might criticise other points, but finding fault is always an invidious task. My object is only to urge the Committee to take more care in drawing up their second report so that it may be throughout of scientific value.

I am, Sir, yours faithfully,

ARCHD. STANLEY PERCIVAL.

Newcastle-upon-Tyne, June 1st, 1922.

## WHY IS SEPTIC AURAL DISCHARGE SO COMMON?

*To the Editor of* THE LANCET.

SIR,—It is to be hoped that the correspondence in your columns upon this subject will not be closed until the question has been thoroughly ventilated. As one who has for some 14 years had daily experience of ear disease among school children, I would like to draw attention to certain points which are of great importance.

1. Dr. Knyvett Gordon has done pioneer work in the question of the occurrence and treatment of suppuration in fever hospitals, and every otologist is persuaded of the necessity of having otologists on the staff of all such institutions. Until this is done children will still be discharged with running ears, some of which (as pointed out by Dr. Kerr Love) are infective. But we are a very slow nation in matters of reform, and, although nearly two decades have passed since this question of specialists in fever hospitals was first mooted, nothing has been done.

2. In many cases of acute suppuration paracentesis is still delayed by general practitioners in spite of universal teaching to the contrary. I have always taught that it is better to incise the membrane clumsily than not to incise at all. I suppose that so long as otology remains the Cinderella of the special departments in general hospitals this state of things will remain.

3. Dr. Ambrose Owen emphasises a very important point when he speaks of the condition in which most of our hospital patients and State school children live. They are constantly exposed to reinfection, they are ill-housed and ill-fed; consequently recurrence of discharge occurs almost as soon as it is cured. Even the radical mastoids become reinfected. School clinics have done much, but aural disease is still classed as a "minor ailment." Every school clinic should have a properly constituted ear department, and this should be under the supervision of a specialist.

4. Another important point is the treatment of adenoids. Parents frequently assert that their children have been worse "since their throats were done." In many cases operation fails because after-treatment is inadequate or wholly neglected. The adenoids infect the nose, the nose reinfects the naso-pharynx after the adenoids are removed—there is a vicious circle. Much harm is also done by persons who rail against the adenoid operation and endeavour to foist inappropriate and inadequate methods (often based upon a total misapprehension of the conditions) in its place. The future treatment of adenoids will be *preventive*, but its time is not yet come.

5. Scarcely a week passes without my hearing the extraordinary statement that a doctor has said that the child will be "all right at seven," or "in seven years," and inquiry generally shows that the assertion has been made.

The question of the prevalence of septic aural discharge is a very large one and does not concern medical treatment alone. It embraces better feeding, better housing, better organisation in health matters, and better organisation of treatment centres.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY,
Consulting Aural Surgeon to the L.C.C., Consulting Aurist to the St. James's Hospital, &c.

Welbeck-street, W., June 5th, 1922.

## DIFFERENTIAL DIAGNOSIS BETWEEN CHOLELITHIASIS AND ULCUS DUODENI.

*To the Editor of* THE LANCET.

SIR,—In your issue of June 3rd, Dr. W. J. McKeand describes a case illustrating the difficulty in differentiation between cholelithiasis and duodenal ulcer. He suggests that a test-meal might have helped in the differentiation; it might, on the other hand, merely have added to the difficulty, for, employing the fractional test-meal, I have obtained in cases of proved cholelithiasis curves of hyperacidity indistinguishable from those obtained in the majority of cases of duodenal ulcer. The hypersecretory curve has now been shown to be merely an expression of reflex pyloric hypertonus sometimes accompanied by hypersecretion, and may therefore result from any lesion in the alimentary tract likely to induce such reflex phenomena. Those cases of gall-stones which simulate duodenal ulcer in their symptomatology are particularly likely to show a hypersecretory curve since the symptoms themselves in all probability depend on reflex pylorospasm. It is possible, therefore, in a case of gall-stones to have hunger-pain, relief by food, tenderness over the right upper rectus, and X ray and test-meal evidence all pointing to a diagnosis of duodenal ulcer, and a positive guaiac test being obtained in the stools (as it frequently may be from slight bleeding from other sources than an ulcer) the picture seems to be almost conclusive.

In these cases the correct diagnosis must depend on a careful clinical history and an inquiry into associate symptoms not usually stressed in cholelithiasis, and finally upon a very complete physical examination in the course of which particular attention is paid to certain areas of referred tenderness which I personally have found most valuable in differentiating gall-stones from the many other causes of epigastric pain. Of the clinical points which I should stress, age and sex and general habit cannot be ignored and in Dr. McKeand's case age and sex were certainly strong points in favour of cholelithiasis. Of symptoms common in gall-stones and uncommon in duodenal ulcer the more important are nausea; a tendency to the occurrence of pain in the early hours of the morning and later than the usual time

of the night pain in ulcer; diarrhœa or slight looseness, especially just after an attack; shiveriness in an attack; a type of pain which may be described as a sense of great fullness or distension in the epigastrium before it becomes too severe to permit description; and the reference of pain to a point between the shoulder-blades or the angle of the right scapula. Of clinical observations likely to prove helpful the temperature taken during or just after a bout of pain is important. It is frequently slightly elevated in cases of gall-stones. The points of abdominal tenderness have been admirably described by Chauffard in his classical book, "La Lithiase Biliaire," and are as follows: (1) under the right costal margin, especially on deep breathing—this is higher than the common point of tenderness in duodenal ulcer; (2) immediately above the umbilicus in the mid-line; (3) on firm pressure on the eleventh rib behind; (4) over the spines of the eighth, ninth, tenth, and eleventh dorsal vertebræ. To these I would add tenderness which spreads down into the appendix region but which is really superficial, and tenderness over the third, fourth, and fifth dorsal spines, which I have found much more constantly present and more definitely marked than that over the lower vertebræ. With the exception of the epigastric and right upper rectus tenderness, these points are not in my experience encountered in cases of duodenal ulcer.

I have recently had under my care a case closely resembling that described by Dr. McKeand, with the added difficulty that the patient was a young man and that, in addition to a suggestive clinical picture, a positive guaiac test in the stools, and an X ray report of irregularity and tenderness of the duodenal cap, he had a hypersecretory curve with the fractional test-meal. I decided to treat him as a case of duodenal ulcer and gave liberal cream and butter, as well as rest, belladonna, &c. He became definitely worse. On re-examination I found that he had well-marked tenderness high up under the costal margin, immediately above the umbilicus and on pressure over the eleventh rib behind. His temperature was 99°F. during an attack. All fats and eggs were excluded from his diet, he was made to take exercise and given urotropine and aspirin, and rapidly lost his symptoms. Later he passed what he took to be a gall-stone, but it was not preserved for investigation.

The failure of duodenal ulcer treatment to relieve symptoms is a further diagnostic point, as the response to strict treatment in duodenal ulcer is usually so good, and fats and eggs are not well tolerated by gall-stone cases. In conclusion, I should like to emphasise the very great importance of examining the patient during an attack of pain, when direct and reflex tenderness are both more likely to be clearly defined; the patient does not have to rely on memory for his description of his symptoms, and the gall-bladder may be palpable. In two cases recently I have felt and heard friction-sounds over the gall-bladder.

I am, Sir, yours faithfully,

Guy's Hospital, S.E., June 5th, 1922. JOHN RYLE.

## THE CASE OF MR. F. W. AXHAM.

*To the Editor of* THE LANCET.

SIR,—As we have been assured in repeated and uncontradicted announcements, that the honour recently conferred on Mr. H. A. Barker owes its origin, at least in part, to the efforts of certain leading members of the medical profession, it would seem inevitable that a not less strenuous attention should now be directed to the position of Mr. F. W. Axham. It will be remembered that some years ago Mr. Axham's name was removed from the Medical Register because of his active association with Mr. Barker's work. I make no pretence either to estimate the value of this work or to review the decision of the General Medical Council. It is, however, certain that but for Mr. Axham's coöperation, Mr. Barker's activities would either have been restricted or, alternatively, would have cost much suffering to many of his patients. The profession can hardly defend a position in which, while the principal, by medical efforts, is promoted to honour, his colleague, by a medical verdict, is declared "guilty of infamous conduct." That both should come under condemnation, or that both should be approved, is at least a consistent judgment. But that one should be exalted and the other contemned stands open to obvious reproach.

I am, Sir, yours faithfully,

C. O. HAWTHORNE.

Harley-street, W., June 4th, 1922.

## SCARLET FEVER IN THE PUERPERIUM: AN INSTITUTIONAL OUTBREAK.

*To the Editor of* THE LANCET.

SIR,—Undoubted cases of scarlet fever occurring during the puerperium and in new-born babies are of interest on account of the views held as to the susceptibility of mothers to this disease and the supposed insusceptibility of young babies. Recently I was asked to see certain cases in a maternity home and I am appending the case notes. I have looked up the hospital records and added three other cases, all of which, with the exception of one, came under my care. All were removed from the maternity home after I had seen them at the request of their medical attendants. All the patients diagnosed to be suffering from scarlet fever presented the full symptoms and signs of the disease. Two of the babies appeared to have been infected in the uterus, while the remainder developed illness after birth. A case of puerperal sepsis and two cases of scarlet fever and concurrent puerperal sepsis are included. All the mothers had escaped scarlet fever up to the time of their admission into the maternity home and were the only ones that had not been previously attacked. The first three patients made uneventful recoveries and occurred as isolated cases, the remaining six are from the recent outbreak.

1. Mrs. A. developed scarlet fever, rash appearing on the second day of puerperium. Baby commenced desquamating when 5 days old.

2. Mrs. B. developed scarlet fever seventh day of puerperium. Baby developed the disease seven days later when 14 days old.

3. Mrs. C. developed scarlet fever on the ninth day of puerperium and the baby showed definite rash when 11 days old. Vomited and had sore throat and a dirty tongue.

4. Mrs. D. was confined on 9/4/22 and developed scarlet fever on the 24/4/22. She was removed to the Infectious Diseases Hospital and ran a normal course. The baby was not infected when discharged.

5. Mrs. E. was confined 24/4/22 and on the 4/5/22 she was removed suffering from puerperal sepsis.

6. Mrs F. confined 9/5/22. Developed scarlet fever on the third day of puerperium, rash well out. The baby showed a good rash and had sore throat when 7 days old, and died six days later from tonsillitis and œdema of glottis.

7. Mrs. G. confined 15/5/22. Developed scarlet fever third day of puerperium, some sepsis also present. Baby did not contract fever.

8. Miss H. confined 8/5/22. Scarlet fever sixth day of puerperium, markedly septic also; very ill; died nineteenth day, puerperal sepsis, septic pneumonia. Baby developed scarlet fever when 6 days old, ushered in by convulsions, definite strawberry tongue and rash.

9. Mrs. K. developed scarlet fever and puerperal septicæmia second day of puerperium 19/5/22. Died after nine days of high fever, some retained placenta having been removed. P.M.:—Acute septicæmia, gangrene of vagina. Baby K. showed a strawberry tongue and desquamated thoroughly.

In Nos. 7, 8, and 9, cultures from the blood-stream contained streptococci of the same strain as those recovered from the uterine and vaginal swabs. Most of the women had extensive vaginal and perineal tears. No. 9 was the subject of post-mortem examination. All the cases shown as scarlet fever desquamated and were thoroughly typical.

Undoubted cases of scarlet fever in mothers and babies and the cases of sepsis were, I believe, separate infections, the septicæmias were in two cases very severe, streptococci being isolated from the blood-stream and the vaginal and uterine swabs. The cases were spread over a fortnight and none of the patients who had had an attack previous to being admitted to the home were in any way indisposed. Prompt isolation and removal to infectious hospital probably prevented other babies being infected.

I am, Sir, yours faithfully,

EUSTACE THORP, O.B.E., L.R.C.S., D.P.H.,
Assistant Medical Officer of Health.

Health Department, Athenæum Buildings,
Sunderland, June 2nd, 1922.

## DANGERS ARISING FROM THE USE OF WRIST-WATCHES.

*To the Editor of* THE LANCET.

SIR,—In his interesting article published in THE LANCET of May 20th Prof. John S. B. Stopford calls attention to the fact that neuritis has resulted from the pressure occasioned by wearing these useful articles. Quite apart from the wrist-watch causing a disability such as neuritis, I might mention that during four and a half years in France it came under my notice more than once that the wrist-watch was responsible for a shattered hand. The wrist-watch had acted as a reflector of the sun and as such had become a favourable target for a sniper's bullet. To the army officer on active service in the front line the wrist-watch may be described as indispensable. For military purposes it should be made so as not to act as a reflector. In France I frequently advised that the watch should be worn on the palmar surface of the wrist. Unless the watch is protected by a wire cover it is, of course, much more liable to get broken in this position.

I am, Sir, yours faithfully,

London, W., June 6th, 1922. J. J. SCANLAN.

# Obituary.

## WILLIAM HALSE RIVERS RIVERS, M.A.

CAMB. (HON. CAUSÂ), HON. LL.D. ST. AND., HON. D.SC. MANC., M.D. LOND., F.R.C.P. LOND., F.R.S.,

PRESIDENT OF THE ANTHROPOLOGICAL SOCIETY.

A GREAT man of science has been lost by the early death of Dr. William Halse Rivers Rivers, whose work was pursued along three different paths with a remarkable instinct for unification; he was a splendidly informed anthropologist, at the same time made an intensive study of comparative ethnology, and used his equipment for the elucidation of the most advanced psychological problems.

Rivers, who was only 56 years of age at the time of his death, was educated at Tonbridge School and St. Bartholomew's Hospital. At St. Bartholomew's he held the junior appointments and later became house physician of the National Hospital for Paralysis in Queen-square, a post which undoubtedly accounted for much in the development of his future work. He made his mark when he published "The Todas," which he followed later with his well-known book on the association of alcohol with fatigue and another valuable treatise, "Kingship and Social Organisation." These books confirmed his position as a first-hand investigator of the beliefs and cultures which lead to racial development, and at the outbreak of the war his learning found particular expression in psychological work of high practical value. Originally serving as a Captain in the R.A.M.C., he became medical officer to the Craiglockart and Maghull Military Hospital, and finally received a special appointment with the Royal Air Force. He became one of the principal exponents of the obvious, though unrecognised, truth that the medical care of the aviator requires a knowledge of psychology, and that the flying man should be recruited with due psychological care. It is no exaggeration to say that Rivers became, in the opinion of many experts, one of our most brilliant researchers in border-land problems, and one whose efforts were successful in extending the boundaries of scientific medicine.

His last work, "Instinct and the Unconscious," a contribution to a biological theory of the psychoneuroses, is an original and highly suggestive book. Here Rivers disclaimed experience of the psychoneuroses in times of peace, and desired that his views should be tested by those whose way such experience had come. Feeling that the intellectual factors which mainly concerned the academic psychologist before the war would not explain human behaviour, he saw in the war, with its enormous physical and mental upheavals, opportunity for new work, and on this basis wrote his interesting and challenging work.

For many years Rivers had been an acknowledged leader in scientific thought. He was awarded one of the Royal Society's medals six or seven years ago, and before the Royal College of Physicians of London, of which body he was a Fellow, he delivered the Croonian Lectures, dealing with the action of drugs on fatigue, and the FitzPatrick Lectures, which were published in full in THE LANCET. These latter, entitled Medicine, Magic, and Religion, were a summary of much of his research, and their closing passage is a good example of the underlying message of his work both as physician and pathologist.

"There can be no greater hindrance to progress in our attempts to understand the mind of the man of lowly culture than the belief so widely held that his actions are determined by motives having that vague and lawless character ascribed by many to the thought of savage man. I believe there is no single department of social life in which it cannot be shown that this view is false."

And earlier in the lectures he said:

"The chief lesson impressed upon us by the facts brought forward is one the importance of which reaches far beyond the limits of our special subject. This lesson is the rationality of the leechcraft of such peoples as the Papuan and the Melanesian. The practices of these peoples in relation to disease are not a medley of disconnected and meaningless customs, but are inspired by definite ideas concerning the causation of disease."

The enumeration of the posts held by Rivers indicates his large range of work. At the time of his death he was Fellow of and Prælector in Natural Science at St. John's College, Cambridge, and President of the Royal Anthropological Institute and the Folk-Lore Society. He had previously lectured on experimental psychology at the University of Cambridge, had been President of the Section of Anthropology of the British Association, and had taken active part in scientific expeditions sent from the University of Cambridge to the Torres Strait. The range of his literary activities has been briefly outlined above, and we take the opportunity of acknowledging our deep indebtedness in these columns for regular and valuable editorial assistance.

Quite recently Dr. Rivers was selected as Labour candidate for the University of London, when his address was published in THE LANCET. His illness was tragically brief.

THE LATE DR. C. A. BRODRIBB.—The death occurred at St. Leonards-on-Sea, on May 30th, of Dr. Charles A. Brodribb, who spent nearly the whole of his professional life at Hastings and St. Leonards. He was born in 1852, a son of Dr. William Perrin Brodribb, a well-known practitioner in Bloomsbury, was educated at King's College, London, and received his medical training at St. Mary's Hospital. He took the L.S.A. diploma and became M.R.C.S. in 1873, and in 1876 he settled at Hastings, where he practised for over 40 years. His health failed towards the end of last year, and after Christmas he had to keep to his house, the end coming not unexpectedly. Born on March 28th, 1852, he was thus in his seventy-first year. He leaves a widow and two sons, one of whom is Dr. A. W. Brodribb.

# Medical News.

A CENTRAL FUND FOR HOSPITALS OUTSIDE LONDON. At the concluding meeting of the British Hospitals Association in Liverpool on May 26th Mr. Frank G. Hazell, general superintendent and secretary of the Royal Infirmary, Manchester, read a paper on Hospital Economics. In these days of rapid motor transport, from the point of view of saving life, it mattered little, he said, whether a hospital was situated in the centre of a town or city or a mile distant. From the point of view of economy, however, it made a vast difference. Its presence of hospital in the town or city was a daily reminder of its work, an appeal, an inspiration, the economic value of which one could not afford to ignore. "Out of sight, out of mind" is singularly applicable to hospitals. Modesty and professional etiquette combined to prevent any real use being made of advertisement in connexion with the wonderful work proceeding within the walls of a hospital. Consequently, the available supply of rich material for propaganda was cut off at its source. Lack of imagination and initiative and reluctance to advertise was the first reason for want of sufficient monetary support. Voluntary hospitals depended upon goodwill for half their income. The voluntary system of hospital management was the most efficient, economical, and humane, and it must be maintained. It could not afford to maintain its present attitude towards publicity. If the payment of a fixed charge was made a condition for admission, the hospitals stood to lose the whole of the voluntary contributions made by patients, the bulk of the hospital box collections and many annual subscriptions, donations, and workshop collections. King Edward's Hospital Fund for London succeeded because of the confidence in its personnel, its convenience, its economic management, and because the control it exercised was a live force. A King George's Hospital Fund for hospitals outside London would prove just as attractive, and would become a vitalising influence, not only as regards expenditure and the control of it, but in regard to income in every provincial hospital. At the conclusion of the discussion following Mr. Hazell's paper it was agreed that a central fund for hospitals should be formed outside London, somewhat on the lines of King Edward's Fund, and the Council of the Association was asked to take the matter in hand.

ORTHOPÆDIC COURSE AT BERCK-PLAGE.—A week's course of instruction in those branches of orthopædics which are of special interest to practitioners will be held at the Institut Orthopédique de Berck, starting on Monday, August 14th. It is open to foreign doctors and students and demonstrations will be given in English and Spanish. The fee for the course is 150 francs, and it will be under the direction of Dr. F. Calot, surgeon to the Hôpital Rothschild. A detailed programme and any other information required will be supplied on application to Dr. Fouchet, Institut Calot à Berck-Plage (Pas de Calais), or to Dr. Colleu, Clinique Calot, 69, Quai d'Orsay, Paris.

FORTHCOMING MEDICAL CONGRESSES IN FRANCE.—The fifth Congress of the Association of French-speaking Pediatrists will be opened on July 10th. Prof. E. Weil (Lyons) has been appointed chairman.—The thirty-first French Congress of Surgery will be held in Paris in October next, the opening ceremony taking place at the Faculty of Medicine on Oct. 2nd. Prof. H. Hartmann will preside. Further information can be obtained from the general secretary, Mr. J.-L. Faure, 10, rue de Seine, Paris.—The sixteenth French Congress of Medicine will be held in Paris between Oct. 12th and 14th. Prof. F. Widal will preside, and Mr. L. Martin, assistant director of the Pasteur Institute, has been elected vice-president.—As already announced in our columns a congress (Congrès Interalliés du Cancer) will be held at Strasbourg in the spring of 1923. The following three questions will be on the programme: (1) Experimental cancer; (2) spontaneous and provoked reactions of the organism against cancer; and (3) treatment of cancer of the breast by radiations.

MEDICAL VISIT TO BATH.—On the occasion of the Spa Attractions Week at Bath last week medical men and their wives, within a radius of 60 miles, were invited to visit the baths and become personally acquainted with the facilities provided. The visitors, who numbered over 200, were met by the local doctors who acted as guides round the baths, the route taken being Pump Room, King's Bath, Queen's Baths, Royal Baths, finishing up with the Roman remains of bathing facilities of a previous period. Mr. J. Hatton, as director of the Baths, welcomed the guests in the absence of Councillor Cooke, chairman of the Hot Mineral Baths Committee. He briefly outlined the attractions which had brought visitors to Bath for 1800 years, pointing out that Bath was the only place in Britain possessing hot mineral spirits, the three springs together yielding half a million gallons of mineral water at a temperature of 120° F. uniform the year round. At the Royal Baths, opened in 1916, treatments exceeding 220,000 in number had been given without charge to war cases. Demonstrations were given in electro-therapeutic and massage departments, and details were seen of the Aix, Plombières, and Bourbon-Lancy douches.

UNIVERSITY OF BIRMINGHAM.—The Ingleby lectures were this year delivered by Dr. J. W. Russell, professor of medicine in the University, who took for his subject Clinical Studies in Some of the Albuminurias of Childhood with Special Reference to Orthostatic Albuminuria. In the first lecture an accurate method for the quantitative estimation of small amounts of albumin in the urine was described, and the lecturer gave the results of an intensive study of two cases of so-called orthostatic albuminuria by this method. In the second lecture he compared the behaviour of the albuminuria of subacute nephritis with that of the orthostatic cases and discussed the ætiology of orthostatic albuminuria.

RONTGEN SOCIETY.—The annual general meeting will be held on June 13th, at 8.15 P.M., in the Institution of Electrical Engineers, Savoy-place, Victoria Embankment, London, W.C. A paper on German Apparatus for the Production and Measurement of X Rays for Deep Therapy will be read by Mr. F. L. Hopwood, D.Sc., and Mr. E. A. Owen, D.Sc. A demonstration of a Balance Method of Measuring X Rays for Therapeutic Purposes will be given by Prof. S. Russ and Mr. L. H. Clark, and one of the Ondoscope by Mr. F. L. Hopwood. Mr. E. A. Owen will contribute a note on the Sphere Gap Voltmeter.

INFECTIOUS DISEASE IN LANCASHIRE.—The measles epidemic reported in THE LANCET, which started in Manchester at the end of March, continues on the increase. In one week early in April the number of cases reported to the corporation was 116, and the number has risen progressively until in the week ending May 27th no fewer than 1014 cases were notified. If the outbreak follows the lines of increase recorded in previous years, it is stated that, in all probability, that figure will be maintained for another fortnight, when it is expected a decline will set in. The authorities are seeing that every case notified is visited, extra health visitors are appointed, and urgent cases are sent to a special ward in hospital. The Manchester health authority considers it desirable to make chicken-pox notifiable for the period of the year when it is most prevalent. At its meeting on June 14th the city council will, under the Infectious Disease (Notification) Act, 1889, be asked to make chicken-pox a notifiable disease in the city for a period of six months from July 1st, 1922.

Oldham is suffering from an epidemic of chicken-pox, and there are cases of small-pox. Both diseases have been made compulsorily notifiable. As many as 170 children are away from one school alone suffering from chicken-pox. At the end of last week there were 80 cases of scarlet fever in the town, and three fresh cases of small-pox were notified, all in one family. The mother sent two of the infected cases to work at two different mills, and another child to school. The mother said she thought it was chicken-pox. The medical officer of health asked the health committee to give him power to prosecute the mother if he thought it necessary.

NEWCASTLE-UPON-TYNE POST-GRADUATE COURSE. From time to time post-graduate courses are held under the direction of a committee representing the council of the University of Durham College of Medicine, the honorary staff of the Royal Victoria Infirmary, and the North of England Branch of the British Medical Association. The syllabus of a special clinical vacation course to be held from July 3rd to 15th at the Royal Victoria Infirmary has now been issued. The mornings will be devoted to clinical medicine, surgery, gynæcology, and pathology (post-mortem examinations); in the afternoons classes will be held in venereal diseases, medical diseases of the eye, and in the examination of the blood and diseases of the blood. Either morning or afternoon course may be taken separately. Those taking part in the course will include Prof. H. Brunton Angus, Dr. D. Wells Patterson, Prof. T. Beattie, Prof. R. P. Ranken Lyle, Dr. E. Farquhar Murray, Mr. A. M. Martin, Prof. Stuart McDonald, Dr. A. F. Bernard Shaw, Dr. A. Parkin, Mr. J. W. Leech, Dr. Horsley Drummond, Mr. G. Grey Turner, Prof. W. E. Hume, Mr. John Clay, Prof. J. D. Wardale, Mr. J. S. Arkle, Dr. Crawford, Dr. R. A. Bolam, and Dr. S. Thompson. The fee for the whole course is £10 10s. and for either course separately £6 6s., payable in advance to the Hon. Treasurer, Mr. W. Frank Wilson, 97, Jesmond-road, Newcastle-upon-Tyne. Applications to attend the course should be sent in not later than June 20th, to Mr. Norman Hodgson, 14, Jesmond-road, Newcastle-upon-Tyne.

# Medical Diary.

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

## SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.
THURSDAY, June 15th.—List of probable papers:—H. M. Evans, M.D.: The Defensive Spines of Fishes, Living and Fossil, and the Glandular Construction in Connexion Therewith and Observations on the Nature of Fish Venoms. Communicated by Dr. H. H. Dale. D. W. Cutler, L. M. Crump, and H. Sandon: A Quantitative Investigation of the Bacterial and Protozoan Population of the Soil, with an Account of the Protozoan Fauna. Communicated by Dr. E. J. Russell. D. W. Devanesen: The Development of the Calcareous Parts of the Lantern of Aristotle in *Echinus miliaris*. Communicated by Prof. E. W. MacBride. A. Lipschütz, M.D., C. Wagner, R. Tamm, and F. Bormann: Further Experimental Investigations on the Hypertrophy of the Sexual Glands. Communicated by Dr. F. H. A. Marshall.

**ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**

*MEETINGS OF SECTIONS.*

**Monday, June 12th.**

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.
*Address:*
Sir Leonard Rogers: Leprosy: its Ætiology and Epidemiology.
*Communications:*
Mr. Denham Pinnock: Quinine Necrosis of Muscles (with Demonstration).
Dr. J. Bamforth: Cortical Necrosis of the Kidney in a Fatal Case of Malaria (with Demonstration).

**Wednesday, June 14th.**

SOCIAL EVENING: Fellows, Members of Sections, Associates and their friends will be received at 8.30 P.M. by the President and Lady Bland-Sutton. Dr. T. M. Legge, C.B.E. (of the Home Office), will deliver a short Address at 9 P.M. on "Industry and Art" (illustrated).
The Library will be open, and various objects of interest will be exhibited. Music, light refreshments, and smoking.

**Thursday, June 15th.**

DERMATOLOGY: at 5 P.M. (Cases at 4.30 P.M.)
*Cases* will be shown.
*Paper:* Mr. J. Jackson Clarke: The Ætiology of Molluscum Contagiosum.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.
TUESDAY, June 13th.—5 P.M., Croonian Lectures (2) Dr. Gordon Holmes: The Symptoms of Cerebellar Disease and their Interpretation.
THURSDAY.—5 P.M., Croonian Lectures (3).

UNIVERSITY OF LONDON.
ADVANCED LECTURES IN MEDICINE (at the Royal Society of Medicine, 1, Wimpole-street, W. 1).
MONDAY, June 12th.—5 P.M., Dr. Murk Jansen (Leiden): Injurious Agents and Growth.

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W. 1.
TUESDAY, June 13th.—5 P.M., Sir William Hale-White: The Clinical Symptoms of Coli Infection of the Urine.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, Springfield Mental Hospital, Beechcroft-road, Upper Tooting.
THURSDAY, June 15th.—4 P.M., Dr. Reginald Worth: Hints on the Examination and Certification of Mental Disorders.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, June 12th.—10.30 A.M., Mr. Maingot: Surgical Pathology. 12.15 P.M., Dr. Burnford: Pathological Demonstration. 5 P.M., Mr. Donald Armour: Surgery of the Spine and Spinal Cord.
TUESDAY.—10 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon, Mr. Sinclair: Appendicitis. 5 P.M., Sir R. Armstrong-Jones: Treatment of Mental Cases.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12 noon, Mr. Simmonds: Demonstration of Fractures. 5 P.M., Mr. Donald Armour: Surgery of the Spine and Spinal Cord.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Cases. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 5 P.M., Dr. E. B. Turner: Epidemic Influenza and its Treatment.
FRIDAY.—10 A.M., Mr. Simmonds: Demonstration of Surgical Cases. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose, Ear. 5 P.M., Mr. MacDonald: Urinary Surgery.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. Daily, 10 A.M. to 6 P.M. 2 P.M., In-patients, Out-patients, Operations, Special Departments.

LONDON HOSPITAL MEDICAL COLLEGE, Mile End, E. Lectures on Advanced Surgery in the Clinical Theatre.
FRIDAY, June 16th.—4.15 P.M., Mr. Hugh Lett: Painful Micturition.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: May–June, 1922.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, June 12th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Papilloedema.
TUESDAY, June 13th.—2 P.M., Dr. Grainger Stewart: Out-patient Clinic. 3.30 P.M., Dr. Risien Russell: Syphilitic Disease of the Nervous System.
WEDNESDAY, June 14th.—2.15 P.M., Dr. Grainger Stewart: Clinical Demonstration.
THURSDAY, June 15th.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Sciatic Neuritis.
FRIDAY, June 16th.—2 P.M., Dr. Gordon Holmes: Out-patient Clinic. 3.30 P.M., Demonstration of Fraenkel's Exercises: Exercise Room.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
NEURO-PATHOLOGY.—Dr. J. Godwin Greenfield.
MONDAY, June 12th.—12 noon, Syphilis of the Nervous System (II.).
THURSDAY, June 15th.—12 noon, Polio-myelitis and Encephalitis Lethargica.
ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.—Dr. S. A. Kinnier Wilson.
TUESDAY, June 13th.—12 noon, Basal Ganglia and Thalamus.
FRIDAY, June 16th.—Physiology of Corpus Striatum and Thalamus.
WEDNESDAY, June 14th.—Demonstration by Mr. Sydney Scott on Labyrinthine Tests.
An inclusive fee of £10 10*s.* will be charged for the whole course. Any part of the course may be taken separately at a special fee. A special arrangement can be made for those unable to attend the whole course. For details with regard to these special arrangements, application must be made to the Dean. Fees should be paid to the Secretary of the Hospital at the office on entering for the course.
C. M. HINDS HOWELL, Dean of Medical School.

INSTITUTE OF PATHOLOGY AND RESEARCH. St. Mary's Hospital, W.
THURSDAY, June 15th.—5 P.M., Prof. Sir Berkeley Moynihan: Diverticula of the Alimentary Tract.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. 1.
THURSDAY, June 15th.—4 P.M., Dr. Thompson: Dwarfs.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. 1.
MONDAY, June 12th.—5.30 P.M., Sir S. Russell-Wells: Failing Heart.

# Appointments.

Certifying Surgeons under the Factory and Workshop Acts: PRIDE, W. A., M.B., C.M. Glasg. (Neilston). WILLAN, G. T., L.R.C.P. Lond., M.R.C.S. (Carlisle).

King's College Hospital: ROBERTS, O. W., M.B., B.S. Lond., Senior Casualty Officer. SURRAGE, H. J. R., M.R.C.S., L.R.C.P. Lond., House Anæsthetist. HOLMES, E. A., M.R.C.S., L.R.C.P., Second Casualty Officer, Assistant House Anæsthetist, and House Surgeon (Urological Department). WHITTLE, C. H., M.B., B.Ch. Cantab., Resident Assistant Clinical Pathologist. RAYNER, H. L. B.M., B.Ch. Oxf.; ALMOND, CHARLOTTE K. J., M.R.C.S., L.R.C.P., House Physicians. EAST, C. F. T., B.M., B.Ch. Oxf., M.R.C.P. Lond., House Physician to the Children's Department and House Surgeon to the Eye Department. CHARLESWORTH, CHRISTOBEL, M.B., B.S. Glasg.; SNELL, H. K., M.R.C.S., L.R.C.P. Lond.; RUDOLF, G. de M., M.R.C.S., L.R.C.P. Lond., D.P.H.; BRYNING, F. A., M.R.C.S., L.R.C.P. Lond.; MITCHELL, A., M.R.C.S., L.R.C.P. Lond., House Surgeons. CHAMBERLAIN, DOROTHY S., M.B., B.S. Lond., Obstetric House Surgeon. ROPER, R. S., F.R.C.S. Edin., Clinical Assistant (Urological Department). BURKITT, F. T., M.B., B.Ch. Cantab., Clinical Assistant (Radiological Department).

Manchester Royal Infirmary: PATERSON, R. S., M.B., Ch.B. Manc., D.M.R.E.Cantab., Radiological Registrar and Medical Officer of Metabolism. CONWAY, RUTH, M.B., Ch.B.Manc., Second Medical Registrar. SMITH, J. W., M.B., Ch.B.Manc., House Physician.

# Vacancies.

*For further information refer to the advertisement columns.*

*Ayr District Asylum.*—Jun. H.P. £300.
*Barnsley, Beckett Hospital.*—Jun. H.S. £200.
*Birmingham, Ministry of Pensions Hospitals, Moseley.*—Two J.M.O.'s. £350 each.
*Bradford Municipal General Hospital, St. Luke's.*—H.P.'s and H.S.'s. Each £200.
*Bristol Royal Infirmary.*—Sen. Res. O. £200. Res. Obstet. O., H.S.'s, and H.P.'s. Each £120. Also Obstetrician.
*Cancer Hospital, Fulham-road, S.W.*—Asst. to Research Dept. £700. Anæsthetist.

*Chesterfield Borough.*—Asst. M.O.H. and Sch. M.O. £500.
*City of London Maternity Hospital, City-road, E.C.*—Asst. Obstet. S.
*City of London Mental Hospital, Stone, near Dartford, Kent.*—Locum Tenens A.M.O. 7 guineas weekly.
*Derby Borough Mental Hospital.*—Asst. M.O. £400.
*Derbyshire Sanatorium, Chesterfield.*—A.M.O. £300.
*Doncaster Royal Infirmary and Dispensary.*—Sen. H.S. £220.
*Glasgow, Bellahouston, Ministry of Pensions Hospital, Cardonald.*—R.M.O.'s £350.
*Hampstead General and North-West London Hospital, Haverstock-hill, N.W.*—Cas. M.O., Cas. S.O., H.P., and H.S. Each £150.
*Hellingly, Sussex, East Sussex County Mental Hospital.*—Jun. Asst. M.O. £350.
*Hospital for Women, Soho-square.*—Clin. Assts.
*King Edward VII. Sanatorium, Midhurst, Sussex.*—Path. £400.
*Kingston, Canada, Queen's University.*—Chair of Preventive Medicine. $3,500.00.
*Lenham Sanatorium, Kent.*—A.M.O. £400.
*Liverpool, Stanley Hospital.*— Two H.S.'s. £120 each.
*Macclesfield General Infirmary.*—Sen. H.S. £200.
*Manchester, Ancoats Hospital.*—Hon. Radiologist.
*Manchester, Grangethorpe, Ministry of Pensions Hospital.*—Jun. M.O. £350.
*Metropolitan Hospital, Kingsland-road.*—Asst. Physician.
*Newport, Mon., Royal Gwent Hospital.*—H.S. £200.
*Poplar Borough.*—Dist M.O.'s. Each £200. Also Public Vaccinator.
*Queen's Hospital for Children, Hackney-road, E.*—Cas. H.S. £100. Also Asst. S. and Asst. P.
*Richmond Royal Hospital, Surrey.*—H.S. £150.
*Rochdale Infirmary and Dispensary.*—Jun. H.S. £180.
*Royal Free Hospital, Gray's Inn-road, W.C.*—H.S.'s., &c., each £50.
*Royal Northern Hospital, Holloway, N.*—Cas. O. £200.
*St. Bartholomew's Hospital.*—Two Jun. Res. Anæsths. £80 each.
*St. George's Hospital, S.W.*—H.S.'s and H.P. £50.
*St. Helens County Borough.*—Asst. M.O.H. £450.
*Salop County Council.*—A.M.O. £550.
*Sheffield Royal Infirmary.*—Two H.P.'s, H.S., Ophth. H.S., and Asst. Cas. O. Each £150.
*South Shields, Ingham Infirmary.*—Sen. and Jun. H.S.'s. £200 and £150 respectively.
*Stoke-on-Trent County Borough.*—Sch. Dentist. £500. Asst. Sch. M.O. £500.
*Sunderland Children's Hospital.*—J.R.M.O. £130.
*University College Hospital, Child Welfare Dept.*—Second Clin. Asst.
*University College Hospital, Gower-street, W.C.*—Ophth. Clin. Asst. £50.
*University of London.*—Sir William Dunn Chair of Pathology. £1300.
*West London Hospital, Hammersmith-road, W.*—Two H.P.'s and H.S. Each £100.
*Westminster Hospital, Broad Sanctuary, S.W.*—Asst. H.P. and Asst. H.S. £52.

# Births, Marriages, and Deaths.

## BIRTHS.

LOCHRANE.—On June 1st, the wife of Charles D. Lochrane, M.D., F.R.C.S., Friar Gate, Derby, of a son.

## MARRIAGES.

ADAM—STEELE.—On June 1st, at Marylebone Parish Church, Stanley Denovan Adam, L.R.C.P., M.R.C.S., to Beatrice Emma Steele, daughter of the late William Steele, formerly of Gate House, Appleby.

CARLILL—GODFREY.—On June 3rd, at St. Margaret's, Westminster, Hildred Carlill, M.D. Cantab., to Mildred Constance Godfrey, younger daughter of Mr. and Mrs. Henry Godfrey, Hertford-street, Mayfair.

## DEATHS.

BRODRIBB.—On May 30th, at Stockleigh-road, St. Leonards-on-Sea, Charles Aikin Brodribb, M.R.C.S., L.S.A., aged 70 years.

ROBINSON.—On May 31st, at St. Mary's Infirmary, Highgate Hill, N., Arthur Henry Robinson, M.D., in his 68th year.

WITHAM.—On May 31st, at his residence, Kirton, Lincolnshire, Henry Witham, M.R.C.S., L.R.C.P., aged 52 years.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*


**THE LANCET: SUBSCRIPTION RATES.**

| | | | | |
|---|---|---|---|---|
| INLAND | One Year | £2 | 2 | 0 |
| | Six Months | 1 | 1 | 0 |
| | Three Months | 0 | 10 | 6 |
| ABROAD | One Year | £2 | 10 | 0 |
| | Six Months | 1 | 5 | 0 |
| | Three Months | 0 | 12 | 6 |

**ADVERTISEMENT RATES.**

Books and Publications .. ..
Official and General Announcements ..
Trade and Miscellaneous Advertisements
} Four Lines and under 6s. 0d.

Every additional line, 1s. 6d.
Quarter Page, £3. Half a page, £6. Entire Page, £12.
Special Terms for Position Pages.


# Notes, Short Comments, and Answers to Correspondents.

## MEDICAL SERVICES AVAILABLE FOR NATIVES ON THE RAND MINES.

BY M. M. PAM, M.B., B.S. LOND.

FROM the time that the natives are recruited to the time they leave the mine to go home again they are under constant medical supervision. At the recruiting stations in the native territories they are vaccinated and given a rapid medical examination. When they reach Johannesburg they are taken at once to one of two compounds—that belonging to the Witwatersrand Native Labour Association or to the Native Recruiting Corporation. Here they undergo a thorough medical examination and are treated for vermin, heads and bodies shaved, clothes baked, and so forth. From here they are sent to the various mines, where they are again examined by the mine medical officer. This examination is necessarily a careful one, as once the boy is passed all responsibility for his welfare rests with the mining company, and it is at this point that a boy who shows any sign of lung or heart disease should be rejected. If the mine medical officer is dissatisfied with his condition he can demand a re-examination by the medical officer of the recruiting agents; if the latter insists on passing him for service the responsibility rests with the recruiting agents in the event of tuberculosis developing.

The boy is given pneumococcal vaccine and weighed on engagement and every month afterwards during his period of employment, any loss of weight being reported to the medical officer. This system provides a useful check on the physical condition of the boys.

### *System of Treatment Centres.*

The arrangements for the medical treatment of natives actually employed on the Rand varies, depending on whether the patient is a mine labourer or in private service. There exist in Johannesburg, and in various towns along the Reef, general hospitals in which a certain amount of space is allotted to native wards; these are maintained for the benefit of natives, men and women, who are not in the employ of any of the mining companies. A native working on the mines in any capacity is treated by the medical officer of the mine, but his wife and family (if they are living on the Rand, which is unusual) are treated at the general hospitals.

The arrangement that prevailed on all the mines until a few years ago was one of small units. A medical officer was appointed to each mine, or occasionally to two neighbouring mines of the same group, having under him a small hospital in which he could treat all his own cases. This arrangement still holds good on a large number of mines, but on those belonging to the Rand mines group it has been abandoned in favour of large central hospitals which serve and are supported by several mines, with an auxiliary system of dressing stations on each individual mine. There now exist four of these large hospitals on the Crown, the City Deep, the East Rand Proprietary, and the Modder B mines.

### *The Central Hospital Organisation.*

The central hospital always has one full-time medical officer, if necessary with an assistant, while the dressing stations are supervised by a part-time medical officer or by a white dressing-station attendant fully qualified for this work. Ambulances connect up the dressing stations with the central hospitals, which have been something of a revolution on the Rand, both in the matter of personnel and equipment. They contain 200 or more beds and are fully equipped with operating theatre, sterilising plant, X ray apparatus, dispensary, and delousing rooms. The theatres are necessarily completely equipped, as many major operations have to be undertaken. The delousing rooms are also a necessary part of the scheme; the dread of a typhus epidemic is an ever-present one to mine medical officers, as it can assume terrible proportions in the large compounds on the mines. There are also always a casualty ward, surgical and medical wards, and an isolation block. No bacteriological or chemical work is undertaken at the hospitals, all material requiring such examination being sent to the South African Institute for Medical Research, to which the mine-owners pay certain annual grants.

### *Types of Cases.*

The most usual medical cases are pneumonias and other chest conditions and abdominal conditions. Typhoid is

nearly always to be found in native hospitals, while there are occasional epidemics of typhus and other infectious diseases. The influenza epidemic of 1918–19 claimed a large number of victims both on the mines and elsewhere in the country.

The surgical cases are most commonly simple and compound fractures and more or less severe lacerations resulting from accidents underground. Recently, however, there have been one or two epidemics of tropical ulcers, which appeared to be much more prevalent in native labourers than in white workers. The organisms found in the lesions were Vincent's fusiform bacillus and a spirillum, and the lesion produced was a slowly spreading indolent sloughing ulcer. A history of trauma immediately antecedent to the ulceration was elicited in nearly all cases. A systematic investigation of the comparative effects of different methods of treatment was interrupted by the cessation of the outbreak, of which a full account has been published by Sir F. Spencer Lister and Dr. H. Q. F. Thompson.[1] Local application of novarsenobillon appeared to give good results in the hands of independent investigators. Ulcers showing fungating masses apparently requiring curettage subsided without interference on anti-scorbutic diet, suggesting that the ulcer was secondary to a scorbutic condition.

*The Nursing Staff.*

The nursing is in the hands of a white matron and white sisters with coloured probationers under them. This was an entirely new departure at the time in this part of the world, and one which is proving successful. The native nurses undergo a regular training in all departments of the hospital, on much the same lines that nurses work in England, and they may become quite efficient. It is a characteristic of the African natives that they can perform routine work excellently when well trained, which in some ways makes them very good material to train for routine nursing; on the other hand, any departure from the ordinary is apt to disconcert them quite disproportionately. There are also native boys as ward attendants, and orderlies; these as a rule speak most of the native dialects and are useful as interpreters.

*The Patients.*

The natives generally make very good patients—as surgical cases they are cheerful and obedient; as medical cases, once they find that they have not died out of hand, they are easy to manage. Moreover, they have that enormous faith in any evil-smelling or tasting medicine that can of itself work wonders. They sometimes show great reluctance to go to hospital, especially if it is situated at any distance from the mine on which they and others of their family and tribe work, but if they are within reach of their "brothers" and can be visited on Sundays (this is allowed) they raise no objections when ordered to hospital. This well-known dislike of being taken away from friends was at one time considered a bar to the establishment of central hospitals, but has not proved a disadvantage as boys will walk considerable distances to see their sick friends and exchange gossip.

*Dressing Stations.*

The dressing stations are only intended for clearing stations and are not equipped to deal with any but slight cases. The attendants in charge, both white and coloured, must hold first-aid certificates, and be competent to put up fractures and check hæmorrhage in order to enable the patient to be moved to the central hospital. Some dressing stations have a few beds attached where minor ailments and slight surgical cases can be treated and where convalescent cases from the hospitals can be kept under observation, but the scope of these stations is intentionally small. The regulations demand that where there are more than 30 beds there must be a full complement of three white attendants to work in eight-hour shifts.

Compensation is paid to the boys on a generous scale for any injury to eyes or limbs which leads to temporary or permanent total or partial disablement. If a limb is lost it is incumbent on the mining company to provide a suitable artificial limb.

*Repatriation.*

Occasionally a boy who is suffering from some very chronic condition becomes bored with hospital life and insists on repatriation, when he cannot be retained, or a boy may be sent home not quite recovered. He then comes under the care of the medical officer at the recruiting station nearest to his home. If his subsequent progress is unsatisfactory he can be returned to the hospital from which he was discharged for further treatment. Some little while ago there was much discussion about the need for obtaining consent for operations. Legally, no boy of discreet age can be operated upon without his consent—practically it is often found that no boy can safely be operated upon without his brother's or his chief's consent, and this can complicate matters considerably. If the patient consents to operation but his "brothers" refuse the medical officer is protected legally, and if the operation is successful all is well; but if the patient dies a strike of the whole compound has been known to follow.

On the whole, the mining natives on the Rand are well cared for and treated; any complaints they have to make are heard by the Inspectors of Native Affairs who visit all the compounds periodically, and whose business it is to investigate all complaints and to ensure consideration of the point of view of the native and his friends.

[1] Tropical Ulcer in Native Mine Labourers in Witwatersrand. Publications of the South African Institute for Medical Research. XIII. September, 1921.

---

## CENTENARY OF ALEXIS ST. MARTIN.

A MOTLEY crowd of Indians and voyageurs was collected on June 6th, 1822, at Fort Mackinac, which lies on the Great Lakes in Michigan, U.S.A., with the proceeds of the winter's hunting, when a Canadian lad, Alexis St. Martin by name, aged about 19 years, was severely wounded by the accidental discharge of a gun. A portion of the abdominal wall was blown away and he seemed sure to die. Whether he lived or died nothing would probably now be remembered of the accident had it not been that Dr. William Beaumont, one of the great men of American medical history, happened to be the army surgeon at the fort at the time. The patient did better than was expected and was brought back to life. The wound had, however, penetrated to the stomach and an opening from the front was left to this organ which never closed.

Alexis, being a poor boy without relatives or friends, became a pauper upon the town of Mackinac, and would have been packed off destitute to Canada had not Beaumont taken pity on him and looked after him in his own family while he was still helpless and sick. It seems that at first it was charity alone which prompted this action, but the master mind of Beaumont soon appreciated the opportunity and realised that here was a chance of seeing what had never been seen before, the change which food underwent during the process of digestion. Till then the fate of food had been unknown, here was the chance. There was begun then in 1825 a series of experiments and a man-hunt which has probably had no equal. In the healing process a sort of valvular opening was formed which allowed the interior of the stomach to be seen, the contents to be withdrawn and material for experiment to be introduced, but which did not prevent food taken by the mouth from passing its ordinary way. Beaumont tied various foodstuffs on to string, dangled them in the stomach through the opening, and withdrew them to see the effect at intervals; he was the first to realise that gastric juice is not secreted continuously but only when food is present or the stomach wall is irritated. He saw the juice gathering on the red lining membrane much as sweat gathers on the skin.

But trouble soon arose. Beaumont went on leave to his home at Plattsburgh on Lake Champlain, taking Alexis with him. Here the proximity of Canada and the scenes of his boyhood proved too much for Alexis. He disappeared. Beaumont was broken-hearted, but after a vain search had to return to duty. It was two years before the whereabouts of the truant was discovered and two more years before he could be persuaded to return, and then only on condition that his wife, for he was now married, and children should be taken into Beaumont's household. Further experiments were made, all the more wonderful in their thoroughness that the experimenter's sole instruments were an ordinary thermometer, a few open-mouthed vials, and a sand-bath. This series of experiments lasted till 1831. The subject was always restless, and occasionally anger and impatience upset the experiment. He returned to Canada once more, and when he came back in 1832 Beaumont decided to take him to Europe, and, to prevent further disappointments, caused one of the weirdest legal agreements to be drawn up that has ever bound two mortals. The following extract shows its nature:—

"The said Alexis will at all times during said term, when thereto directed or required by said William, submit to, assist and promote by all means in his power such physiological or medical experiments as the said William shall direct or cause to be made on or in the stomach of him the said Alexis, either through or by means of the aperture or opening thereto in the side of him, the said Alexis or otherwise, and will obey, suffer and comply with all reasonable and proper orders or experiments of the said William in relation thereto and in relation to exhibiting and showing of his said stomach and the powers and properties thereof, and of the appurtenances and powers, properties, situation and state of the contents thereof."

The agreement was for one year, and Beaumont was to clothe Alexis and to pay 150 dollars. The European journey did not come off, and in 1833 Beaumont published at Plattsburgh his book on the experiments, a book which is now one of the medical literary treasures of the States. The physician and the subject were now famous, and both Americans and Europeans vied to obtain Alexis for further experiment. The British Association wished to vote money to bring him over, and one of Beaumont's friends wrote to him "to be watchful or these wiley Englishmen will slip him over before you are aware of it." To tie Alexis more firmly and to help in his pay he was enlisted in the United States Army and was made a sergeant. The end of the experiments came in 1834 when after leave Alexis failed to return. From then till Beaumont's death in 1853 a constant series of attempts were made to entice him over the frontier. He was living in abject poverty and had taken to drink. He accepted all money paid in advance as an earnest of good faith, but regularly failed to carry out his share of the bargain. He lived until 1880. Sir William Osler made a gallant attempt to obtain a post-mortem examination, but the friends of Alexis proved as obdurate after his death as he himself had done during his lifetime.

## A HOLIDAY SCHOOL IN VIENNA.

WE have received from Dr. P. Neumann, of Vienna, a well-known athlete and son of the late Hofrat Prof. Dr. Neumann (who formerly took English pupils), a letter asking for the support of the English medical profession for his holiday school for Viennese middle-class and poor children, including the children of physicians. Communications should be addressed to him at 18, Gentegasse, 70, Vienna, Austria.

## GOLF FROM TWO SIDES.

A BOOK with this title (London: Longmans, Green and Co., 1922, pp. 197, 10*s.* 6*d.*), written by Roger and Joyce Wethered, two of the most distinguished exponents of the modern school, will be widely appreciated by all classes of golfers. Even the hopeful duffer may read its pages without straightway becoming perfectly hopeless, and we can imagine no higher praise than this. It is an austere doctrine that the authors preach, and their constant insistence on the straight left arm has a certain metaphorical significance; "the golf swing is not intended to represent the acme of comfort" is a sentence which illustrates very well their point of view, and it says much for the personalities of the authors that the reader returns to the book again and again, not only in the desire to excel, but also in the hope of earning a word of praise from such redoubtable professors. What may be called the chatty chapters are worthy of those devoted solely to instruction, and, together with a number of good illustrations, help to make a really admirable book.

## CHOLERA IN RUSSIA.

ACCORDING to telegraphic information received from the People's Health Commissariat in Moscow, 3301 cases of cholera were reported during the ten weeks ending May 6th. Provisional returns published by the People's Health Commissariat give the total number of cases notified in Soviet Russia and the Ukraine between Jan. 1st and April 22nd as 2111—namely: (*a*) 697 cases in Soviet Russia—622 among the civil population and 75 in the Red Army. The figures are highest for the city of Rostov (223 cases—civil population 171, Red Army 52) and for the city of Ufa (115 cases). (*b*) 1132 cases reported from the Ukraine: these were distributed in 42 localities. The most heavily infected governments are the government of Poltava (535) and the government of Kharkov (151 cases in the city of Kharkov); 116 cases were reported during the period under review on the Ukranian railways. (*c*) 25 cases, of which 1 was in the Red Army, occurred in the Caucasus. (*d*) 171 cases were notified in Central Asia, of which 4 occurred in the Red Army. (*e*) 86 cases occurred on railways, giving a total for the Russian Federation, including the Ukraine, of 2031 cases among the civil population and 80 in the Red Army.

## SMOKELESS FUEL.

Prof. H. E. Armstrong, in an address at the annual meeting of the Manchester and Salford Sanitary Association held in Manchester on May 30th, stated that the problem of producing smokeless, cleanly fuels suitable for general use had now unquestionably passed into the final experimental stage and was ripe for practical application. It was open to us to preserve our national inheritance, the open fire, which beyond all question was superior to any other form of heating in cheerfulness and healthfulness; we might get rid of visible smoke and greatly diminish noxious fumes produced by burning raw coal. The gas companies should lead the way and become purveyors of both solid and gaseous fuels. The smokeless fuel for industrial use will be best produced at the pit head. It had, however, yet to be proved that the nuisance which we assumed attached to the use of coal in cities would be overcome when only smokeless fuels were used. Vast amounts of fine dust were produced in our cities and discharged into the atmosphere, and the extent to which they contributed to the production of gloom and made dirt, as distinct from soot, had yet to be ascertained. Ammonium chloride formed from salt in coal and volatilised in the smoke seemed to be the chief enemy of stonework; plants suffered most from sulphur dioxide, its effects were immediate and much worse than those due to any clogging by soot. Much more was required to be done than get rid of visible smoke. The use of raw coal must be discontinued. Gas had many good qualities but also many remarkably evil ones. Formerly we spoke of "coal gas." In most towns this appellation is no longer applicable to the airy mixture that is purveyed—"coke and water gas" or perhaps "suicide gas" would be more appropriate. The use of coal must be rationalised, not merely to get rid of the smoke nuisance, but in order that it should not be wasted as it now was. The difficulties attending the use of raw coal were greatly diminished, if not overcome, if coal were first washed and then subjected to carbonisation at a low temperature. By adopting smokeless fuel we should not only avoid smoke, but would make possible many economies in other branches of industry.

## ALEXANDRA DAY.

Alexandra Day this year takes place on June 21st. There are in Greater London alone at least 168 subcommittees and every part of the metropolitan area should be thoroughly covered. About 12,000 sellers are expected to be attached to the different depôts. The collection for hospitals, convalescent homes, and kindred institutions and charities is not confined to London. Eight hundred centres throughout the country will join in the celebration, although not all on the same day. It will be remembered that Alexandra Day is a double charity, as all the roses are made by cripples. When the day was inaugurated in 1912, only 120 cripples were employed, but there are now 320 girls, working all the year through, who could probably not earn their living in any other way. Still more rose-sellers are needed and also motor-cars for use on June 20th and 21st to deliver supplies to the various hotels which are giving stalls, and to private houses, and to collect the money and convey it to the banks. The London City and Midland Bank have undertaken to count the contents of the money-boxes, and are keeping their branches open until late in the evening for this purpose. The organiser is Miss C. May Beeman, 33, The Grove, Boltons, London, S.W. 10, where all communications should be addressed.

## THE METHODS OF THE CANINE DEFENCE LEAGUE.

*To the Editor of* THE LANCET.

SIR,—My dog, a retriever 18 years of age, a friend and companion for 16 years, fell ill. Due to an anonymous letter sent to the Canine Defence League, an official of that Society called upon me advising me to let her send a veterinary surgeon to examine the dog. I assented. The assistant secretary of the League and a kennel man called, who declared that no dog should be allowed to live after 14 years, and advised its destruction. I paid their fee and the dog was killed. Three weeks later an action was entered against me for cruelty and chaining the dog. The prosecution was based upon the anonymous letter and a statement that the lady official alleged I had made to her that I had kept the dog on the chain for 16 years. I had made no such statement, and indignantly denied it, stating that I had taken the dog for a long series of years—indeed until old age forbade it—upon Sundays for long rambles. I was compelled to keep the dog on the chain during business hours, for a dog of mine had once severely mauled a customer; but, as I stated, the dog almost always had freedom at night. Four witnesses gave evidence in support and denied that there was any cruelty, and this charge fell through, not a single witness being called by the prosecution. But as I could not swear that the dog was off the chain every night I was fined 21*s.* and costs. But what I write to protest against is the methods of the League that followed. The next morning the case was published with such headings as "Canine Penal Servitude," "Chain Cruelty," &c., and the Canine Defence League proceeded to persecute me by issuing large pictorial posters, particularly in this district, referring to my case. As a result I receive anonymous letters, attacking my character, and my business is injured.

These are the real facts, and I must leave it to your readers to form an impartial judgment thereon.

I am, Sir, yours faithfully,

A. J. WILMSHURST.

128, Southwark Park-road, London, S.E.,
May 24th, 1922.